

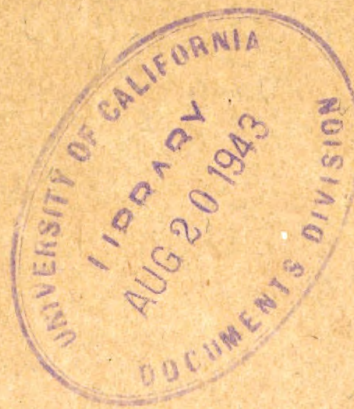
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1943
WAR DEPARTMENT

U.S. Dept. of Army
TECHNICAL MANUAL

QUARTERMASTER SALVAGE
THEATER OF OPERATIONS

March 15, 1943



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TECHNICAL MANUAL
No. 10-260

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WAR DEPARTMENT,
WASHINGTON, March 15, 1943

QUARTERMASTER SALVAGE—THEATER OF OPERATIONS

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*This manual supersedes tentative TM 10-260, May 30, 1942.

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CHAPTER 1

GENERAL

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SECTION I

GENERAL

Object.....	Paragraph 1
Scope.....	2
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1. Object.—The object of this manual is to furnish detailed information and instruction to officers and enlisted men engaged in salvage activities in the theater of operations.

2. Scope.—The manual describes in detail the organization and operation of a quartermaster salvage collecting company, a quartermaster salvage repair battalion, and a quartermaster salvage depot in the theater of operations.

3. Definition.—The word “salvage” is derived from the Latin, *salvare*, to save. In time of war any article that is abandoned becomes salvage. A new overcoat or a serviceable machine gun is salvage, if discarded. The peacetime definition of salvage as “waste material,” or “junk,” must be set aside, and for it must be substituted “serviceable and unserviceable material abandoned or worn out in modern warfare.”

4. Importance of salvage.—*a.* The saving, or salvage, of new or used Government property is of the greatest importance in time of war. Although salvage activities save many millions of dollars, the financial saving is the least important result of the work. It is the conservation of equipment and raw materials and their speedy return to Army use that is vital. Equally vital is the relief afforded to rail and motor transportation and the resulting economy in oversea tonnage.

b. It is therefore the duty of each member of the Army to cooperate in every possible manner in order that discarded and unused Government property may be conserved and reclaimed. Everything has a value. Nothing must be wilfully destroyed. “Accountability” ceases in the theater of operations, and “responsibility” becomes the patriotic

duty of every officer and every soldier, in order that the property of the Government will be safeguarded and, if abandoned or worn out, turned in for salvage.

SECTION II

THEATER OF OPERATIONS

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5. General.—*a.* The theater of operations comprises that area of the theater of war in which military operations are or may be conducted. Initially, in a campaign, the theater of operations may include only a combat zone, the installations and facilities of the zone of the interior being used for the service of the combatant troops. However, as soon as the advance is such that all territory gained is not required for combat operations, a communications zone is organized.

b. The commander of the theater of operations, in addition to directing combat operations, is responsible for the provision and distribution of supplies, and the control of all means of transportation within the theater. He organizes the system of supply in the manner best suited to the performance of its proper functions.

c. The communications zone comprises that portion of the theater of operations containing the principal establishments of supply and evacuation and other agencies required for the continuous service of the forces in the combat zone. In some instances the communications zone may become so extended in depth as to make further subdivision desirable. The zone is then divided into advance, intermediate, and base sections. The latter may be further subdivided into numbered sections, for example, "Base Section No. 1", "Base Section No. 2", etc.

d. The combat zone comprises the forward area of the theater of operations. It should embrace only the territory required for active operations and for necessary supply and evacuation establishments for the immediate supply of troops in the combat zone. It is divided into army areas. The forward part of each army area is divided into service commands, which, in turn, are divided into corps, troops, and division areas. Each army, corps, and division area covers the zone of operations of the unit to which it pertains, and is under the control of the commander thereof. The army service area covers that territory between the rear boundaries of the corps areas and the rear boundary of the combat zone. The mass of army establishments and army service troops is usually located in this area.

6. Geographical organization.—For type of geographical organization in theater of operations see figure 1.

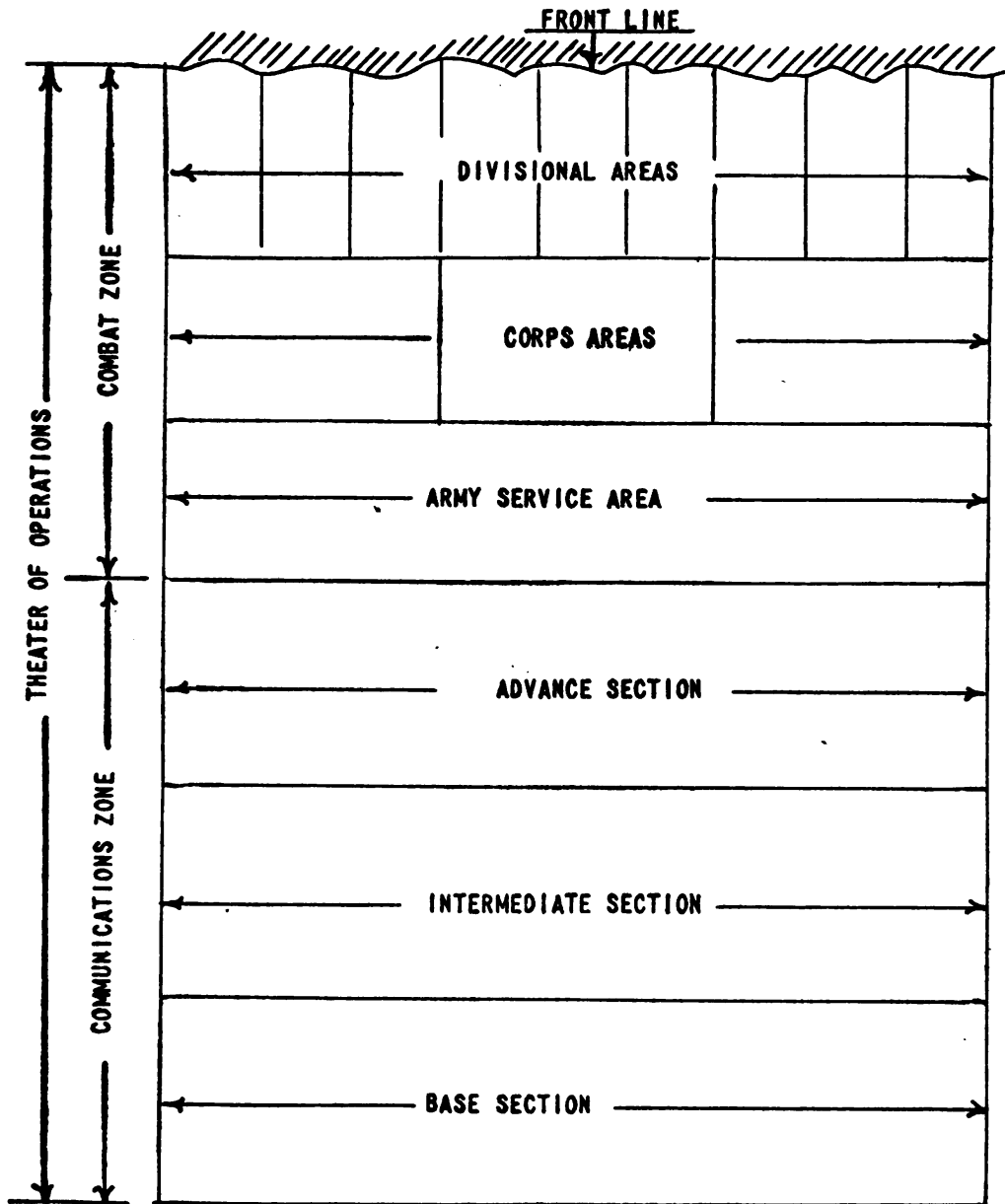


FIGURE 1.—Geographical organization in theater of operations.

7. Chain of command.—*a.* The commander of the theater of operations determines the general principles governing the operation of salvage establishments within the theater.

b. The commander of the communications zone organizes and directs the operation of the communications zone in conformity with the general and specific directions promulgated by the commander of the theater of operations.

c. The chief quartermaster, communications zone, is the principal officer of the Quartermaster Corps on the staff of the commander of the communications zone, and is specifically charged with the operation of all salvage establishments in that zone.

d. The army, corps, and division quartermasters are the principal quartermaster officers of their respective organizations, and are specifically charged with the operation of salvage establishments in the combat zone.

8. Salvage organizations.—There are three types of quartermaster salvage organizations which operate in the theater of operations:

a. The salvage collecting company, which collects salvage of all arms and services, including material lost or abandoned by our own or enemy forces throughout the theater, and effects its proper disposal.

b. The salvage repair battalion (semimobile), which repairs and returns to issuing quartermaster depots salvaged quartermaster property, and which normally operates in the intermediate or advance section of the communications zone.

c. The salvage depot, which performs the same services as the salvage repair battalion, except on a much larger scale and in a stationary plant, probably located at a base port or in the intermediate section.

9. Flow of salvage.—*a.* Damaged or abandoned property is collected in the combat zone and advance section by troops and collecting companies. It is sorted, classified, and sent to appropriate repair units by the latter. Quartermaster salvage that is reparable goes to the salvage repair battalions until their capacities are filled. Salvage beyond their capacities and unreparable material are forwarded direct to the stationary salvage depots. Salvage from the intermediate and base sections is sent by organizations and collecting companies to the salvage repair battalions or to the salvage depots, as local conditions dictate. Repaired articles for reissue are shipped by the salvage repair battalions and salvage depots to such quartermaster depots as may be indicated by the quartermaster, communications zone. Waste materials are disposed of locally or shipped to the zone of the interior.

b. As in the case of using arms and maintaining services, salvage personnel will be prepared to destroy matériel in their possession upon receipt of proper orders. Normally, enemy matériel will be destroyed first, and fuel and motor transport before other matériel.

CHAPTER 2

SALVAGE COLLECTING COMPANY

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SECTION I

GENERAL

Function.....	Paragraph 10
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10. Function.—The salvage collecting company is charged with the collection of salvage within its area, the receipt and classification of salvage at salvage collecting points, salvage dumps, and railheads, and with the evacuation thereof to quartermaster repair shops and depots and to the dumps, depots, and repair shops of other arms and services. The salvage collecting companies are army or theater reserve troops, and are assigned to geographical areas or attached to corps, as may be directed.

11. Operating capacity.—The company is designed to collect, sort, and evacuate the normal amount of salvage to be expected from a reinforced corps. In periods of extended forward movement, when large battle areas have to be cleaned up, the personnel of the company will be supplemented by specially assigned labor troops.

12. Organization.—*a.* The salvage collecting company comprises a company headquarters, three platoons of two sections each, and seven enlisted men attached from the Ordnance Department, seven from the Chemical Warfare Service, and seven from the Signal Corps.

(1) The company headquarters is comprised of a captain, five non-commissioned officers, and fifteen privates to administer, supply, subsist, and supervise the technical activities of the company as a whole.

(2) The platoon is the basic operating unit. It is commanded by a lieutenant, and consists of platoon headquarters and two sections. In the platoon headquarters are one sergeant and seven privates; in each section are one sergeant, two corporals, and twenty-four privates. In general, one platoon will service a division.

b. Each officer and enlisted man is armed with a carbine.

c. The transportation assigned consists of four $\frac{1}{4}$ -ton, 4 x 4 trucks, eight $2\frac{1}{2}$ -ton cargo trucks, seven 1-ton trailers, six $2\frac{1}{2}$ -ton wreckers (one per section), and three 4-ton wreckers (one per platoon). Additional transportation for other purposes will be obtained, when necessary, from the division, corps, or army quartermaster.

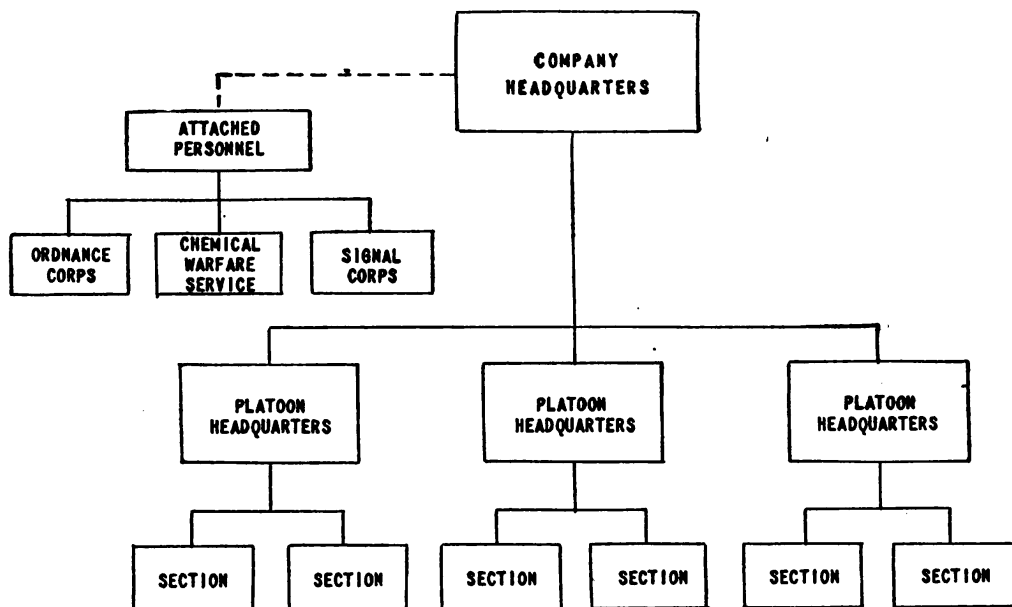


FIGURE 2.—Quartermaster salvage collecting company.

13. Duties of officers.—*a.* Although salvage collecting companies are army or theater reserve troops, salvage officers at all times should keep in close touch with division and corps quartermasters in their areas in order that any instructions issued regarding salvage in the area by the division or corps commander may be readily executed.

b. Salvage officers will request division, corps and army quartermasters to so advertise their dumps and operations as to bring them and the necessity of salvage work to the attention of all officers and enlisted men of the Army in their locality. They will put up conspicuous signs showing locations of their dumps. They must not wait for salvage to come to them but must be constantly on the alert to see that all salvage in their area is collected. They will do everything possible to stop unnecessary waste and to help units dispose of salvage.

c. Each salvage officer will thoroughly familiarize himself with current orders pertaining to salvage operations. He must continually move about in his area, supervising the work of his unit and of such labor troops as may be assigned to the salvage work of his division, seeing that personnel is used to the best advantage and that salvaged material is put into circulation with as little delay as possible. He

must be thoroughly acquainted with traffic circuits and other transport arrangements in his area, and must keep in close touch with the chiefs of staff departments in his division. He must at all times be thoroughly informed as to shipping instructions and destinations for salvage for other arms and services.

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OPERATIONS

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Collection of battlefield salvage.....	16
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Sorting and classification.....	18
Loading and shipping.....	19
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14. Types of operations.—*a.* There are three types of salvage operations:

(1) *Routine salvage.*—Collection, classification, and disposal of normal salvage in all areas occupied by troops.

(2) *Battle area salvage.*—Collection, classification, and disposal of salvage from battlefields.

(3) *Dismantlement.*—Dismantling of entrenchments, mine galleries, etc., after a forward movement has rendered them unnecessary.

b. Dismantlement is a function of the Corps of Engineers and need not be discussed in this manual. Routine and battle area salvage are the responsibility of the salvage collecting company.

15. Collection of routine salvage.—*a.* Routine salvage operations are carried on in all areas occupied by troops in the theater of operations, including the communications zone, the army service area, and such divisional and corps areas at the front as are in a static condition.

b. Due to scarcity of raw material, all abandoned property, however worthless it may appear, has some value. Wherever conditions permit, such material as empty boxes, grease, bones, etc., will be collected and disposed of. At all times the salvage company will collect clothing, shoes, canvas, webbing, personal equipment, ordnance property, and all other Government property.

c. The collection of salvage does not rest entirely on salvage collecting companies, but is a responsibility of all unit commanders. The cooperation of all units in collection of salvage and in provision of transport is of primary importance, and salvage officers will keep in close touch with all officers commanding units in their respective

areas. Their aim should be to give all possible assistance to commanding officers, and in return to secure their interest and help.

d. Salvage personnel is not large enough to collect and return to dumps all the routine salvage of the Army. Commanders of units must see to it that transports returning empty from the front are fully utilized for the return of salvage. Further, they must see that no abandoned property is left behind and that no able man or prisoner of war returns from the combat area without bringing some salvaged article with him. To facilitate this, the salvage officer will establish advance dumps as far forward as possible. The efficiency and success of a salvage officer depends to a great extent on the help and cooperation he can obtain from other commands.

e. Unserviceable articles sent back through normal channels of supply reach the repair shops or depots more rapidly and in better condition than those abandoned and collected by salvage companies at some later date; consequently, they can be brought into further use more rapidly and at less cost in labor and money.

f. In rest areas, the camps, training areas, or towns that have been evacuated, billets and all other buildings used by troops for any purpose will be searched systematically and quickly for salvage material, and the inhabitants will be warned to turn in all Government property that may be in their possession. When a division is about to evacuate such an area, it is advisable to assign several salvage men to familiarize themselves with the buildings so that the search for salvage may be conducted rapidly and efficiently. Salvage companies, however, are not to do the police work of evacuating organizations which should be done by the respective organizations.

g. When an organization leaves a forward training area for the front, all clothing in the possession of soldiers, above the amount authorized to be worn or carried on the person or in trains, will be turned in to the salvage collecting unit in whose area the organization has undergone training. After renovation and repair at a quartermaster salvage depot, the clothing will be reissued. All other materials should be collected in dumps and evacuated as quickly as possible by the salvage collecting unit.

h. Preventable waste must be avoided. Every case should be reported without delay to the headquarters of the division or corps concerned, or of the lines of communication, in order to fix responsibility. To stop preventable waste is the duty of every officer and noncommissioned officer.

16. Collection of battlefield salvage.—*a.* During an offensive operation, the primary object of salvage is to collect those particular articles which are in constant demand, and to return them

promptly to channels of supply for reissue. Some of the most important of these articles, such as arms and ammunition of all kinds, deteriorate with exposure; consequently, rapidity of collection is essential.

b. When necessary, labor troops, with additional motor equipment for transportation of salvage to advance truckhead or railhead salvage dumps, will be assigned to assist the personnel of the regularly assigned salvage unit.

c. The salvage officer will reconnoiter the battle area in order that—

(1) Those areas where salvage exists in large quantities and can be easily collected may be worked first.

(2) The requisite amount of labor can be allotted to each locality.

(3) The best arrangements may be made for the evacuation of salvage.

(4) Priority may be given to those categories of salvage of most importance at the moment.

d. The salvage officer will divide his area into subareas and work them in rotation. Such subareas should, if possible, be bounded on one side by a light railway or road. To clean a subarea it is generally best to work in small groups, each under a noncommissioned officer. One or more groups should be assigned specifically to the collection of fired cartridge cases and other ammunition components. The remainder of the groups should be detailed to collect general salvage.

e. Salvage units will not collect unexploded artillery projectiles, aerial bombs, mortar bombs, grenades, or rockets. These may be in a dangerous state and attempts to move them may result in an explosion and loss of life. They must not be touched except by qualified ordnance personnel attached to the salvage collecting company who will mark their position and report to the division ordnance officer or his representative for instructions as to their disposition.

f. Unfired artillery ammunition in dumps will be reported to the division ordnance officer or his representative who will direct its movement and reissue. All small-arms ammunition, fired or unfired, will be collected by the salvage unit and forwarded to the division dumps where it will be sorted into serviceable and unserviceable lots.

g. Gassed clothing and equipment, usually collected at dressing stations, will at all times be segregated from other salvage. Personnel handling this material will wear gas masks and protective clothing. If proper protection is not afforded, serious burns may result. Contamination by gas is detected chiefly by the sense of smell. If running water is available, gassed clothing should be submerged

therein until it can be removed to a laundry for decontamination. Chemical Warfare Service personnel attached to salvage units will supervise the handling of gassed equipment.

17. Salvage dumps.—*a.* Small salvage dumps will be established as near the front as possible. These will be plainly marked and will receive the salvage brought in by returning soldiers. Every effort will be made to prevent large accumulations of salvage at such dumps and the cooperation of all arms should be obtained to insure the provision of transportation for daily evacuation of this material to main dumps.

b. Main dumps will be established when possible at railheads. When railroads are not available they will be located on main motor arteries.

c. Each squad of a salvage collecting company is furnished with a storage tent, which will be used for storage of perishable or valuable equipment.

18. Sorting and classification.—*a.* Only superficial segregation of salvage will be made at advance dumps. More careful classification will take place at main dumps where the main body of the salvage platoon is located.

b. All ammunition will be removed from clothing, belts, etc.

c. Clothing will be searched for personal property, and enemy clothing for documents, orders, etc., which will be delivered to the division intelligence officer or his representative.

d. Salvage will be segregated first according to the arms or services to which it pertains. Representatives of the Ordnance Department, Chemical Warfare Service, and Signal Corps attached to the collecting company will be stationed at the main dumps to aid in this segregation.

e. At least one man from the Ordnance Department with a thorough knowledge of bombs and grenades will be stationed at each main dump to examine and remove detonators from bombs or grenades that may have been inadvertently brought in with salvage.

f. Material pertaining to arms or services other than the Quartermaster Corps will be forwarded to their respective depots. It is the duty of the salvage officer to know at all times the proper destinations for such material.

g. Gassed clothing and equipment will at all times be carefully segregated and plainly marked.

h. Where possible, an oil bath should be constructed and rifles, machine guns, bayonets, etc., should be examined, cleaned, and oiled as soon as received. Care should be taken that all fire arms are unloaded.

Rifles should be securely tied in bundles of three, two butts down, in such a manner that they will be injured as little as possible during transportation. Machine guns, automatic rifles, etc., should be rolled in bags, paulins, or canvas, and plainly tagged to indicate contents.

i. Clothing, shoes, and personal equipage will be sorted by items and sacked when possible. Care will be exercised to keep this material dry.

j. All parts of unserviceable articles which can be used in remanufacturing should be salvaged. In this class are included copper, brass, parts of firearms, wagon parts, harness and saddlery of every description, empty ammunition shells and cases, automobile parts and tires, boxes, reels, cable drums, and metals in general.

k. Captured enemy matériel will be evacuated through the usual channels to the interested arm or service for study and for use. Salvage personnel will invite the attention of intelligence officers to new or unusual articles of enemy equipment.

l. On no account will articles be issued by salvage collecting companies. All salvage passing through their hands will be returned to quartermaster repair companies, quartermaster salvage depots, quartermaster depots, or to depots of other arms or services.

19. Loading and shipping.—a. In loading freight cars at rail-head dumps, the following procedure should be complied with:

(1) Before loading a car it should be thoroughly swept out.

(2) When materials are boxed, the boxes should be nailed up lightly; one or two slats should be nailed across the top of the box so that the contents may be ascertained without opening.

(3) A box should contain one type of article only.

(4) Such articles as meat drippings or oil of any kind should never be shipped in the same car with clothing, shoes, etc.

(5) If a small amount of metal is to be shipped in a car of clothing, it should be placed on the floor at one end of the car. Heavy articles or cases should never be packed on top of bundles containing clothing or shoes.

(6) Horse equipment should never be loaded so that it can come in contact with clothing.

(7) Nothing should be shipped while wet. This particularly applies to clothing, canvas, burlap, and rubberized goods.

(8) Cards should be clearly lettered with crayon (never with ink) and pasted on both sides of the car. The following information should be included: car number, contents, destination, and shipping officer.

(9) A copy of the manifest should be tacked in a conspicuous place on the inside of the car.

- (10) Each car should be loaded to capacity.
 - (11) Each car should be sealed before shipment.
 - (12) Gassed equipment should be packed in cases plainly marked.
- The car should also be marked on the outside "Gassed clothing,"

SALVAGE SHIPPED

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FIGURE 3.—Model salvage shipping form.

the cards being firmly attached so that there is no danger of the car arriving at its destination without a warning on the outside as to contents. No other material should be packed in a car with gassed material.

b. The above instructions, except *a*(8), (9), and (11) apply also to shipments by truck.

20. Records.—*a.* For each carload, truckload, or separate smaller shipment made by a salvage company to a repair or issuing depot a form similar to model shown in figure 3 will be filled out in triplicate.

b. In railroad shipments one copy of this form will be disposed of as outlined in paragraph 19*a*(9), one copy will be retained by the platoon commander, and one copy will be forwarded to company commander.

c. In truck shipments, one copy will be given to the truck driver, one will be receipted by the truck driver and retained by the platoon commander, and one will be forwarded to the company commander.

d. Copies of the form will be cleared to the company commander daily and will be used by him to compile records of salvage handled by the company.

CHAPTER 3

SALVAGE REPAIR BATTALION

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SECTION I

GENERAL

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Flow of salvage.....	25

21. Function.—*a.* The function of the salvage repair battalion is to sterilize, clean, repair, and return to issuing depots salvaged clothing, shoes, textiles, canvas, rubber, and other quartermaster articles. It does not make repairs or do laundry work for individuals. Unreparable articles and other waste materials are shipped to a salvage depot, or, if no depot exists, to the base quartermaster.

b. The battalion is designed to handle the salvage repair expectancy of an expanded corps.

22. Organization.—*a.* The battalion is composed of the battalion headquarters, a sterilization company, a laundry company, and a salvage repair company (semimobile).

b. The equipment is carried in semitrailers and is completely mobile. The personnel depends on the motor pool for transportation and is therefore not mobile.

23. Location.—The battalion will operate in positions designated by the army command. Such positions will probably be as far forward in the theater of operations as practicable and near an advance quartermaster depot, in order to enable the battalion to handle salvage both from divisions in the front line and in the rest areas, and to turn over repaired articles promptly to the advance quartermaster depot for reissue.

24. Dispersion.—In field operations the battalion will be dispersed as the nature of the terrain and considerations of protection from air attack may dictate. It will operate in two operating units,

each to consist of two mobile sterilizers, eight mobile laundries, one mobile shoe repair unit, one mobile clothing repair unit, and one mobile textile and metal repair unit. The operating units usually will be widely separated, as each is capable of serving 25,000 troops.

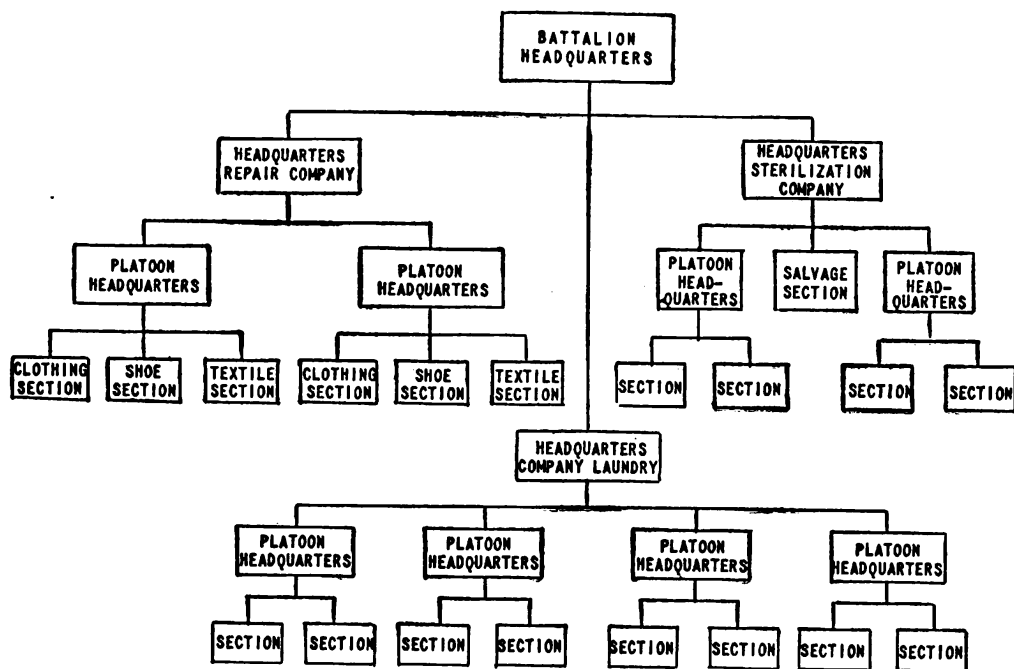


FIGURE 4.—Quartermaster salvage repair battalion (semimobile).

25. Flow of salvage.—*a.* Figure 5 shows the position of the various parts of an operating unit in relation to one another. Distances between sections will be as short as terrain and requirements for safety permit.

b. Salvage upon receipt will be sorted into types according to its route through the repair process. Clothing, blankets, webbing, etc., will go first to the sterilizer, second to the laundry, and third to the appropriate repair unit. Canvas, metals, rubber, etc., which require neither sterilization nor laundering, will be sent direct to the appropriate repair unit. Whenever possible, articles will be sent to the sterilizers in quantities permitting straight loads of single items.

c. Repaired articles are sent to a quartermaster depot for reissue. Irreparable articles and waste materials are shipped to a salvage depot or, if none exists, to the base quartermaster. Decision as to reparability will be made in the repair unit concerned.

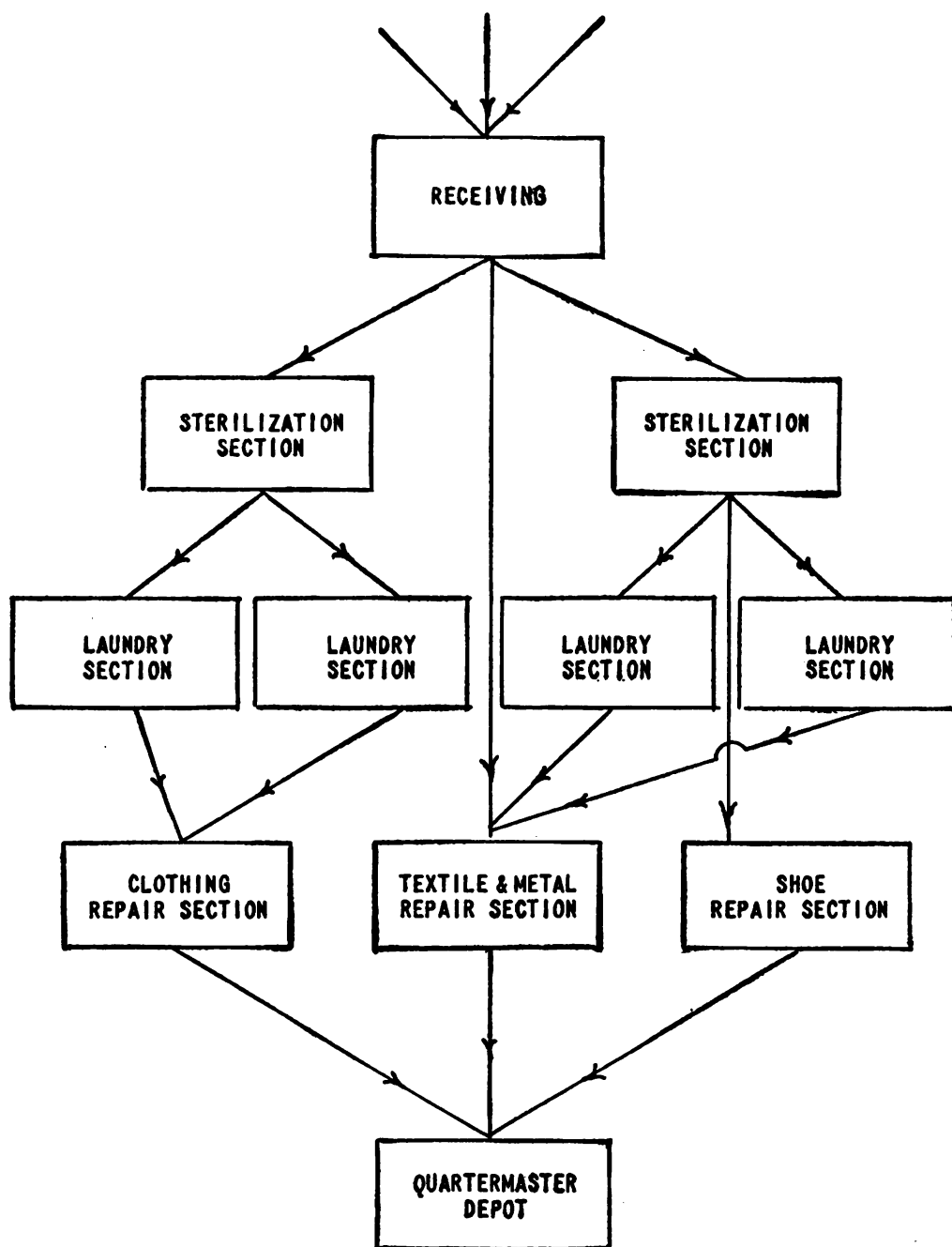


FIGURE 5.—Flow of salvage through operating unit of quartermaster salvage repair battalion (semimobile).

SECTION II

BATTALION HEADQUARTERS

Function	Paragraph 26
Personnel	27

26. Function.—The function of the battalion headquarters is to coordinate and direct the activities of the three companies which constitute the battalion, the laundry company, sterilization company, and salvage repair company, and to consolidate their operating reports.

27. Personnel.—*a.* The personnel assigned to the quartermaster headquarters, salvage repair battalion (semimobile), in accordance with T/O 10-236, consists of three officers, two warrant officers and fifteen enlisted men.

b. The officers are one lieutenant colonel, commanding officer; one major, second in command and executive officer; one captain; adjutant.

c. One warrant officer acts as personnel adjutant and one as supply officer.

d. The enlisted personnel includes: one master sergeant, battalion sergeant major; two technical sergeants, one supply and one personnel; four clerks; two chauffeurs; two orderlies; and one basic.

e. There are assigned to this headquarters one 1/4-ton, 4 by 4 truck, one 3/4-ton command car, and one 3/4-ton weapons carrier.

SECTION III

STERILIZATION COMPANY (SEMIMOBILE)

Function	Paragraph 28
Organization	29
Equipment	30
Operation	31

28. Function.—The function of the sterilization company, operating as part of the salvage repair battalion, is to sterilize the salvage received by the battalion that requires sterilization. It does not sterilize clothing or equipment for return to an individual.

29. Organization.—*a.* The company consists of company headquarters, a supply and salvage section, and two platoons; each platoon is comprised of the platoon headquarters and two sterilizer sections. (See T/O 10-177.)

b. The company headquarters consists of a captain, commanding officer; a master sergeant, superintendent; and fifteen additional enlisted men; comprising the administrative personnel.

c. The supply and salvage section consists of one technical sergeant, operating supplies; one sergeant, salvage foreman; one chauffeur, six clerks; six laborers; and one basic.

d. Each platoon headquarters includes a lieutenant, commanding; one technical sergeant, sterilization foreman; one staff sergeant, engineer; one chauffeur; one general mechanic; and one basic.

e. Each section consists of one sergeant, sterilization foreman; one corporal, sterilization assistant foreman; one corporal, operating supplies; six clerks; two firemen; six laborers; four sterilizer operators; four processors; and three basics.

30. Equipment.—*a.* The equipment of each of the four sterilization sections is installed in a semitrailer (two-wheel, van type, 22 feet by 8 feet by 6 feet 6 inches high). The prime movers are 4- to 5-ton, 4 by 4 tractor trucks.

b. (1) In each sterilization trailer the following equipment is installed:

1 sterilizer.

1 boiler, 30 hp, with oil burner.

1 hot water generator.

12 shower heads.

1 water pump.

1 ignition and light generator.

1 valve, pressure reducing, 125-pound to 15-25-pound.

1 gasoline engine.

1 fuel tank, 5-gallon, gasoline.

1 fuel tank, 40-gallon, fuel oil.

(2) The following equipment is included with each trailer, but not installed:

1 water pump, portable.

400-foot hose, drain, 1½-inch.

175-foot hose, suction, 1½-inch.

1 set spare parts.

1 set tools.

2 sets duck tubing with canvas sides.

100 nets, laundry, 24 by 30 inches.

100 pins, whale (net).

100 bags, canvas, valuable, with identification tags.

6 tents, storage, complete with flies, pins and poles.

2 tubs, foot, rubber.

c. There are also assigned to the company four 2½-ton cargo trucks with 1-ton trailers, one ¾-ton truck, weapons carrier, and one ¼-ton truck.

31. Operation.—*a.* The semitrailers should be parked on fairly level ground near a source of water. The dolly wheels should be lowered to take the weight off the front end, rear wheels chocked front and back, and the prime mover disconnected. The trailer sides

and rear should be opened, and jacks in each corner should be lowered, and the trailer leveled, care being exercised not to take all the weight from the rear axle and dolly wheels.

b. Set stack in place. Suction hose should be attached to pump on the trailer. Use only enough suction hose to reach the source of water supply, and attach strainer on suction end. Place strainer entirely under water but not on the bottom. If the distance from the water supply or lift is beyond capacity of pump on trailer, place a portable gasoline-driven pump in line at the water's edge. Attach the drain hose, using enough hose to carry water well clear of trailer. Check fuel tanks, filling them if necessary.

c. Start the water pump, or both pumps if necessary, and fill boiler with two gages of water. Ignite oil burner and build up steam to 15 pounds. With all other valves closed, the fireman opens steam valve to the jacket of the sterilizer one turn only, permitting the jacket to heat slowly for 10 minutes. This valve is then opened wide, permitting pressure in the jacket to build up to 15 pounds gage.

d. Salvage material to be sterilized is received in the bulk clothing storage tent. Processors place the materials loosely in nets, being sure that no leather goods are included; nets are then secured with whale pins and delivered to the sterilizer.

e. Nets of clothing received from the processors are placed in the sterilizer basket by the sterilizer operators. Forty-eight nets should constitute a load, but under no circumstances should nets be packed tightly in the basket. No leather goods should be placed in basket. The basket is then pushed into the chamber and the door closed and secured. The sterilizer operator watches the indicating thermometer until the temperature reaches 240° F. At this point the time is noted as the beginning of the period of sterilization. During the following 20 minutes the temperature should rise slowly to 250° F. Close attention to temperature and time are essential, and the operator should not leave the sterilizer during this period.

f. At the close of the exposure period, the sterilizer operator closes the steam chamber valve and opens the atmospheric exhaust valve until the chamber gage shows zero pressure. He then closes the atmospheric exhaust valve and opens the vacuum exhaust and steam to ejector valve. This causes clean air to enter the chamber through the air filter and to circulate through the chamber to the atmospheric exhaust, serving as a medium for conduction of vapors and odors from the drying load to the vent system. The period of drying should require 10 to 15 minutes if the load has been properly arranged, that is, not tightly packed. During this period the chamber gage should indicate a vacuum of 5 or 6 inches. At the close of the drying period operator closes vacuum

exhaust and steam to ejector valves. After the vacuum has been relieved through the air filter, and the chamber gage shows zero, the chamber door is opened. If a noticeable vapor escapes when the door is opened, the drying period should be increased.

g. The operator then pulls out basket, unloads immediately, removing all clothes from nets and shaking out the wrinkles while the clothes are still hot. Under no circumstances should clothes or other articles be permitted to remain in the chamber unless the door is wide open. Nets and pins will be returned to the bulk clothing tent. Shut off all valves unless the sterilizer is to be used again shortly.

h. The sterilized articles are sent to the salvage tent and sorted; such as are obviously rags are sent to the battalion salvage pile; those that require washing are sent to the laundry company; and those that do not require washing are sent to the proper repair sections of the salvage repair company. All articles are tied in bundles and plainly marked as to classification.

i. Daily, before heating the sterilizer, the operator cleans the bottom chamber with water, being sure the plug screen is in place. He removes the plug screen, cleans all lint and dirt from the pores of the strainer (strainers in all lines, including the oil line, should be cleaned daily), blows down the boiler 1 gage twice during each operating shift, and tests the pop valve at the beginning of each day shift. He also sees that all moving parts are properly lubricated. A small stock of spare parts and tools are supplied with each unit.

j. Minor repairs and adjustments can be made in place by the general electrician, general mechanic, or steamfitter. Minor repairs and adjustments to vehicles can be made in place by the automobile mechanic.

SECTION IV

LAUNDRY COMPANY (SEMIMOBILE)

	Paragraph
Function	32
Organization	33
Equipment	34
Operation	35

32. Function.—The function of the laundry company, operating as part of the salvage repair battalion, is to wash in preparation for repair such salvage received by the battalion as requires laundering. No laundering is done for individuals.

33. Organization.—*a.* The company consists of a company headquarters and four platoons; each platoon comprises platoon headquarters and two laundry sections as shown. (See T/O 10-167.)

b. Company headquarters consists of a captain, commanding officer; a master sergeant, superintendent; and twenty-five enlisted men.

c. Each platoon headquarters consists of a lieutenant, commanding; one technical sergeant, foreman; one staff sergeant, assistant foreman, mechanic; one sergeant, operating supplies; and one each chauffeur, clerk, general mechanic, and steamfitter.

d. Each section consists of one staff sergeant, assistant laundry foreman; one corporal, assistant laundry foreman; one clerk; two enginemen, stationary, gasoline; two firemen; four folders; four laborers; four markers; four tumblers; four washmen; and three basics.

34. Equipment.—a. The equipment of each of the eight laundry sections is installed in two semitrailers (two-wheel, van type, 22 by 8 feet by 6 feet 6 inches high). The prime movers are 4- to 5-ton, 4 by 4 tractor trucks.

b. (1) The following equipment is installed in each laundry trailer:

- 1 boiler, oil-fired, 15 hp.
- 1 generator, gasoline-driven, 12 kva.
- 1 hot water heater and tank, 180-gallon.
- 1 water supply pump, motor, 25 gpm.
- 1 washer, 30 by 30.
- 1 extractor, 20-inch.
- 2 dry tumblers, 36 by 30.
- 2 fuel tanks, 40-gallon.

(2) The following equipment is included with each trailer but not installed:

- 1 storage tent, complete with poles, flies and pins.
- 2 tables, 3 by 8 feet.
- 1 200-foot, 4-inch hose.
- 1 225-foot, 1½-inch hose.
- 2 jacks, hydraulic, 5-ton.
- 1 strainer.
- 4 baskets, canvas, 8-bushel.
- 1 set hand tools.
- 1 pump, portable, gasoline motor-driven.
- 1 set spare parts.

c. There are also assigned to the company five 2½-ton trucks, cargo with trailers, one ¼-ton truck, and one ¾-ton weapons carrier.

35. Operation.—a. Two units operate together, the two trailers being placed side by side so that the left platform and right platform of the units when opened and let down are close enough to form a practically solid platform. Thus the operating crew is able to walk from one unit to another, and only one crew is necessary to operate the mechanical equipment of two trailers. This arrangement also affords added protection during inclement weather.

b. After the semitrailers have been placed side by side and the platforms opened, the trailers must be leveled. It is not only necessary that trailers be level, but also that they rest firmly on the ground, in order to absorb all vibration from the mechanical operation of the equipment. The front end of the trailer, while carried on the tractor-truck, is necessarily higher than the rear, which means that provision must be made for lowering it to the same level as the rear when setting up for operation. As soon as the tractor-truck moves the trailer into location, the landing gear should be cranked down and the wheel chocks put into position. Steel plates are set under the landing gear wheels and also under the corner stand-jacks.

c. There must be a space of 3 or 4 inches between the bottom of the landing gear wheels and the top of the steel plate resting on the ground, while the trailer is still attached to the tractor-truck. It may be necessary to dig into the ground in order to get the necessary space between the wheels and plates. As soon as this space is obtained, the tractor-truck should move out slowly, thus gradually lowering the trailer into a level position. As soon as the tractor moves out, lower the four corner stand jacks on the plates and screw them down until they have absorbed a part of the weight carried by the landing gear and the rear springs. Corrections in leveling may be made with these jacks.

d. When it appears that the trailer is level, it should then be checked with a carpenter's level to determine the corrections, if any, to be made. It is not always practical or possible to secure 100 percent leveling. However, every effort should be made to make an absolute level, because prolonged periods of off-level operation will result in excessive wear and damage to the bearings on the washer, extractor, and tumblers.

e. After the trailer has been leveled, the gasoline engine on the generator should be started and allowed to warm up. During this period, all sewer and water supply hose connections should be made. After all connections have been made secure by use of wrenches and it has been determined that there are no air-sucking connections, the main switch is thrown and the water pumps (or pump, if only the main pump is being used) are started in order to fill the system with water. *When the water heater tank is filled, the make-up tank half-filled, and the boiler shows $2\frac{1}{2}$ gages of water, the oil burner on the boiler may be started.* It is essential that this amount of water be present before starting the boiler fire, in order to provide the margin of safety desired for boiler operation. Failure to have ample water in the system before starting the fire or to maintain a supply after

steam generation has started causes the majority of boiler explosions.

f. The water system will require from 15 to 40 minutes to fill, depending upon the tightness of the water connections, the operating efficiency of the pumps, and the load demand made upon the pumps by the distance of the trailer from the source of water supply and the total suction lift. When the boiler has generated approximately 75 pounds pressure, the main steam valve is opened *slowly*. Steam valves for the two tumblers should also be opened gradually in order to permit proper operation of the traps in removing condensate. At least 10 minutes should be required to complete the opening of the tumbler steam valves. It will probably be necessary to wait for the hot water tank to heat water, unless boiler personnel have arrived early enough to have a full head of steam and hot water available when it is desired to start the unit.

g. Tents are pitched at each end of the trailers while the latter are being prepared for operation. Two tents are necessary, one for the classification of articles and the other for supplies, shop, and administrative work.

h. The washing formula is as follows:

<i>Minutes</i>	<i>°F.</i>	<i>Inches</i>
5 break suds.....	90-100	8
5 break suds.....	90-100	5
3 rinse.....	90-100	9
3 rinse.....	90-100	9
3 rinse.....	90-100	9

i. Upon completion of the washing process, the articles will be placed in the extractors which will be run 5 minutes for each load. Assuming the washer is loaded to capacity, approximately two and one-half extractor runs will be required for a washer load. When the garments have been extracted, they will be placed in the dry tumblers and dried, which will probably require from 20 to 30 minutes, depending upon temperature and humidity. Drying will be quicker during the summer months, or in tropical locations, than during the winter or in frigid locations when the tumblers will lose considerable heat by radiation.

j. When dry, the material will be sorted by articles and delivered to the appropriate section of the salvage repair company. No attempt will be made in the laundry sections to determine the reparability of an article.

SECTION V

SALVAGE REPAIR COMPANY (SEMIMOBILE)

	Paragraph
Function-----	36
Organization-----	37
Equipment-----	38
Operation-----	39

36. Function.—The salvage repair company is charged with the reclamation for reissue of shoes, clothing, webbing, canvas, textiles, rubber, and such other equipment as the facilities of the company permit.

37. Organization.—*a.* The company consists of company headquarters and two platoons, each platoon comprising platoon headquarters, a shoe repair section, a clothing repair section, and a textile repair section. (See T/O 10-237.)

b. The company headquarters consists of a captain, commanding officer; a master sergeant, general superintendent; and twenty-three additional enlisted men.

c. Each platoon headquarters consists of one lieutenant, in charge; two staff sergeants, one foreman for each shift; one technician grade 4, utility repairman; one chauffeur; and one clerk.

d. Each shoe repair section consists of two technicians, grade 4, shoe foreman; twenty shoe repairmen; four shoe repairmen's helpers; two harness makers; one chauffeur; and two basics.

e. Each clothing repair section consists of two technicians, foreman clothing repair; sixteen sewing machine operators; six tailors; one chauffeur; and two basics.

f. Each textile repair section consists of two technicians, grade 4, foreman canvas repair; twelve sewing machine operators; eight tailors; four metal workers; one chauffeur; and two basics.

38. Equipment.—*a.* The equipment of each of the six repair sections is installed in a semitrailer (two-wheel, van type, 22 by 8 feet by 6 feet 6 inches high). The prime movers are 4- to 5-ton, 4 by 4 tractor trucks.

b. In each semitrailer there is installed a gasoline engine driven electric generating set (5-kw, 3-wire, 110- to 220-volt, alternating current).

c. (1) In each clothing repair semitrailer the following equipment is permanently installed:

(a) Six machines, sewing, single-needle, plain-sewing, with $\frac{1}{3}$ -hp, 220-volt, 60-cycle, single-phase, electric transmitter.

(b) One machine, darning, cylinder bed, complete with $\frac{1}{3}$ -hp, 220-volt, 60-cycle, single-phase, electric transmitter.

(c) One machine, button-sewing, complete with $\frac{1}{3}$ -hp, 220-volt, 60-cycle, single-phase, electric motor.

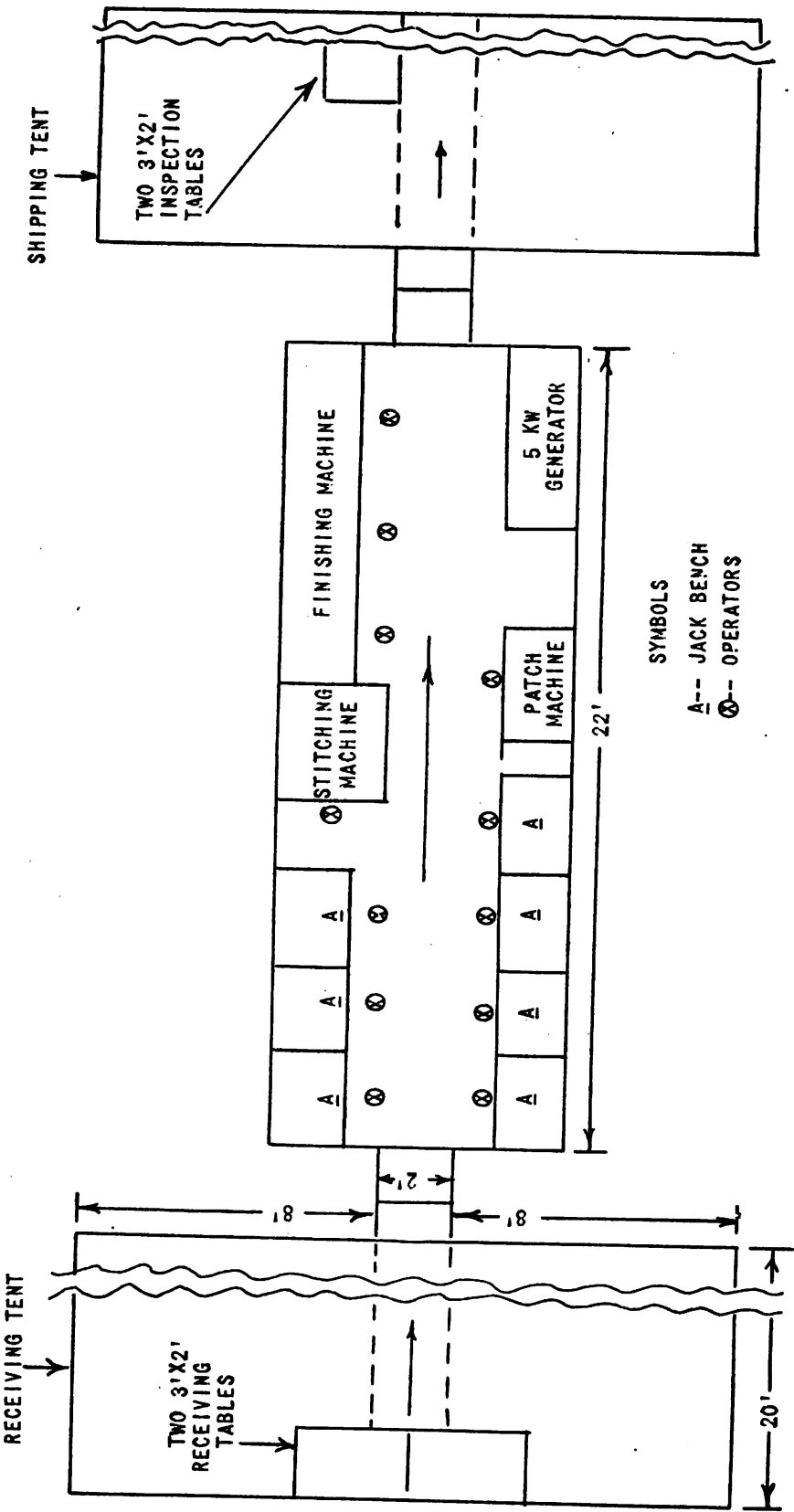


Figure 6.—Shoe section.

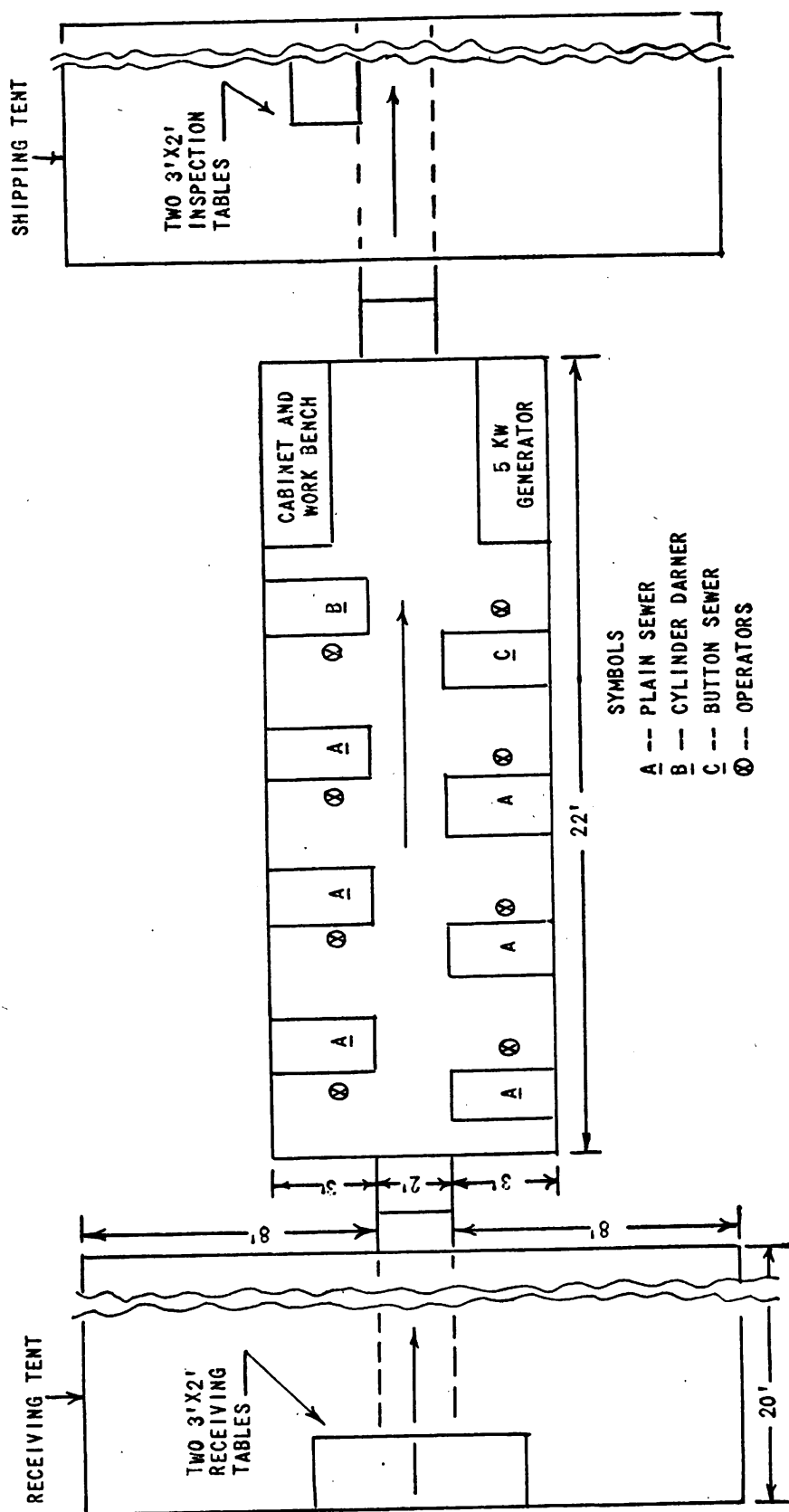


FIGURE 7.—Clothing section.

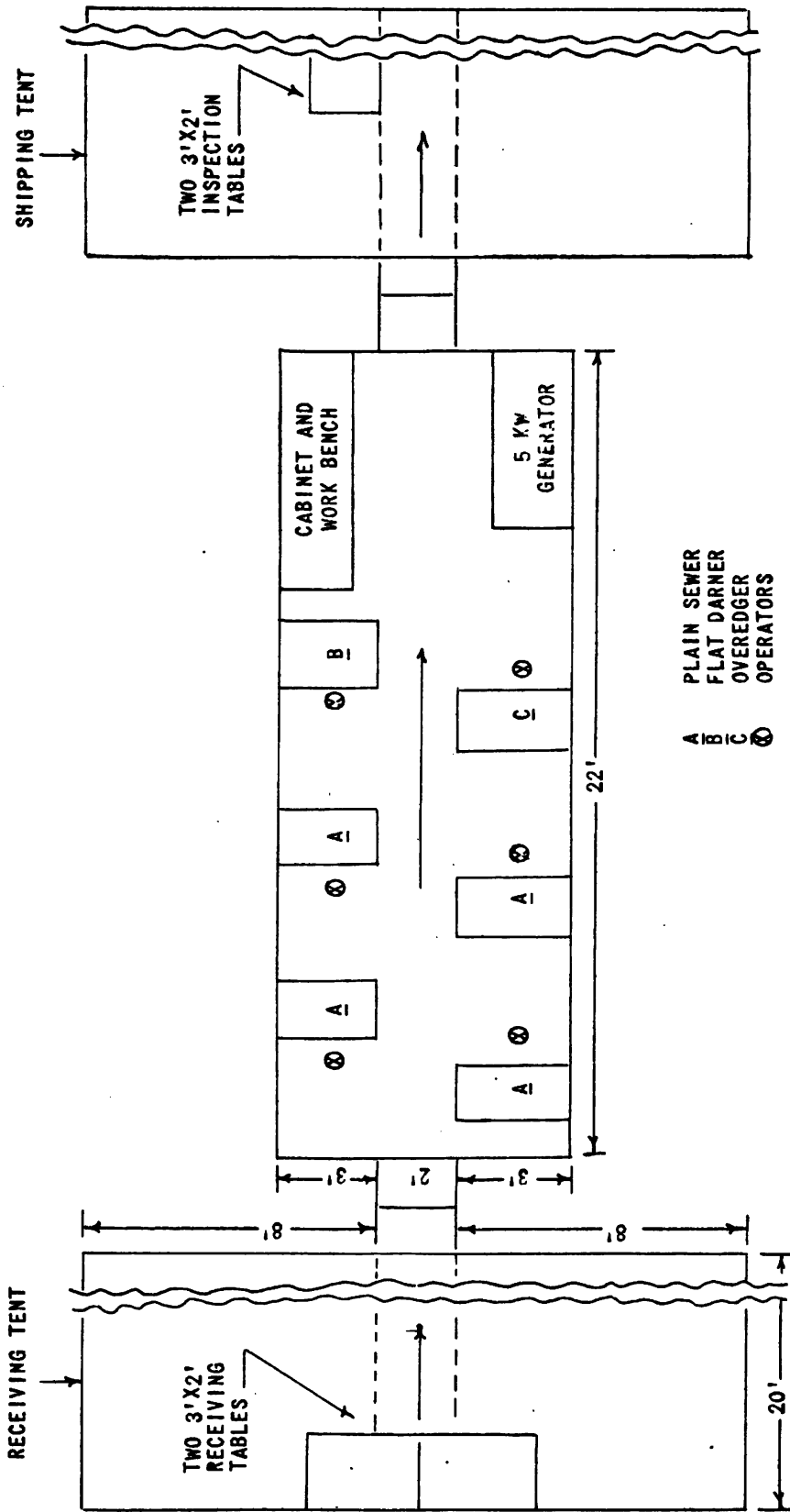


FIGURE 8.—Textile section.

- (d) One machine, tack-button, hand-operated.
- (e) One cabinet, sheet metal, 62 inches wide, 24 inches deep, 36 inches high.

(2) The following equipment is included but not installed:

- (a) Four tables, camp, folding.
- (b) Eight chairs, metal, folding.
- (c) Two tents, storage, complete with flies, poles, and pins.
- (d) Eight shears, tailors, 10-inch.

d. (1) In each textile and metal repair semitrailer the following equipment is permanently installed:

(a) Four machines, sewing, single-needle, plain-sewing complete with $\frac{1}{3}$ -hp, 220-volt, 60-cycle, single-phase, electric transmitter.

(b) One machine, darning, flat-bed, complete with $\frac{1}{3}$ -hp, 220-volt, 60-cycle, single-phase, electric transmitter.

(c) One machine, sewing, overedge, complete with $\frac{1}{3}$ -hp, 220-volt, 60-cycle, single-phase, electric transmitter.

(d) One machine, tack button, hand operated.

(e) One cabinet, sheet metal, 78 inches wide, 24 inches deep, 36 inches high.

(2) The following equipment is included but not installed:

- (a) Four tables, camp, folding.
- (b) Six chairs, metal, folding.
- (c) Two tents, storage, complete with flies, poles, and pins.
- (d) Eight shears, tailor's, 10-inch.
- (e) Assorted hand tools for metal repair.

e. (1) In each shoe repair semitrailer the following equipment is permanently installed:

(a) One machine, finishing, approximately 9 feet long, complete with blower and $1\frac{1}{2}$ -hp, 220-volt, 60-cycle, single-phase electric motor.

(b) One machine, patching, foot-operated.

(c) One machine, combination, sole-cutter and skiver, hand-operated.

(d) One machine, stitching, curved needle, heavy duty, with $\frac{1}{2}$ -hp. 220-volt, 60-cycle, single-phase, electric motor.

(e) One jack bench, sheet metal, with wood top, four-drawer, 10 feet long, 2 feet wide, $2\frac{1}{2}$ feet high, with four bench jacks.

(f) One jack bench, sheet metal with wood top, three-drawer, $7\frac{1}{2}$ feet long, 2 feet wide, $2\frac{1}{2}$ feet high, with three bench jacks.

(2) The following equipment is included but not installed:

- (a) Four tables, camp, folding.
- (b) One chair, metal, folding.
- (c) Two tents, storage, complete with flies, poles, and pins.
- (d) Hand tools, assorted.

f. There are assigned to this company, in addition to semitrailers and prime movers, one $\frac{1}{4}$ -ton, 4 by 4 truck, one $\frac{3}{4}$ -ton truck, weapons carrier, and three $2\frac{1}{2}$ -ton cargo trucks with 1-ton trailers.

39. Operation.—*a.* The company is semimobile, that is, the personnel is not mobile, having to depend for its transportation on the motor pool. The equipment, however, is fully mobile and can be transported from place to place without disruption of service except during the period of actual travel. Each repair trailer is drawn by its own tractor. The trailers are extremely maneuverable and can easily negotiate secondary roads usually encountered in the vicinity of rest areas to which repair activities are largely confined. Preparatory to movement, all external equipment such as tents, tables, supplies, etc., will be loaded in the center aisle of the trailer and all machinery securely anchored by means of tie rods.

b. Each platoon is designed as to equipment and personnel to handle in one shift the salvage of 12,500 troops; or a company of two platoons, two shifts, may handle the salvage of 50,000 troops.

c. When established in the field for operation, the three repair trailers are placed at distances from one another dictated by considerations of safety from air attack. They will be as close as possible to the laundry units from which they receive the bulk of their material for repair. (See fig. 5.) Each section will erect one of its storage tents at each end of the trailer, allowing a straight flow of salvage through the receiving tent, the center aisle of the trailer, and into the shipping tent. It will be the duty of the commanding officer to carry out approved methods of camouflage, as directed by higher authority, both in his selection of position and in the camouflage of the tents, trailers, and prime movers.

d. The salvage repair company will operate in two shifts; the Tables of Organization provide personnel for such operation, insuring the maximum use of the equipment.

e. Operations in the shoe section will be as follows (see fig. 6 for lay-out):

(1) The receiving tent is a regulation storage tent placed at the front end of the trailer with the back of the tent opened to permit passage by way of the platform steps into the trailer. Shoes are received after sterilization and sorted for reparability. Repairable shoes will be routed through necessary operations as fast as capacity permits. They will be paired either before or after repair, as conditions make advisable. Irreparable shoes will be segregated with waste materials from other sections for return to salvage at the base.

(2) The shoe repair unit consists of a standard commercial semi-

trailer (van type, 22 feet long, 8 feet wide, and 6 feet 6 inches high) having doors at each end and three windows on each side. The repair equipment is installed on either side, leaving a center aisle for free flow of shoes through the trailer. Supplies are stored in the benches beneath the jacks. Care should be taken in loading supplies to insure a proper weight distribution.

(3) The shoes proceed through the trailer, from jacks to stitcher, to finisher, to patcher, after which they are delivered to the shipping unit. The actual repair processes are described in appendix I.

(4) The shipping tent is similar to the receiving tent at the opposite end of the trailer. Here the repaired shoes are carefully inspected for unsatisfactory or insufficient repair. After heel pads have been inserted, the shoes are bundled and stacked to await removal to a quartermaster depot.

(5) In the shipping tent the saddler and harnessmaker washes, repairs, and assembles harness and saddles.

f. Operations in the clothing section follow the same system of flow as in the shoe section. (See fig. 7 for lay-out.) Tents are set as described in *e*(1) above, clothing is received from the laundry, sorted, and marked for repair in the receiving tent, irreparable items are segregated, reparable items pass through repair operations in the trailer and are inspected and bundled for shipment in the shipping tent. Detailed repair processes are described in appendix II.

g. Operations in the textile and metal section follow the same flow as in the other sections (see fig. 8 for lay-out). Blankets, webbing, barrack bags, etc., are received from the laundry; tentage, raincoats, and metals bypass the sterilizers and laundries and come directly to this section. Salvage is sorted and marked for repair in the receiving tent. All that requires machine work is processed in the trailer. All metal repair is effected in the shipping tent. In general, the only tentage repaired in the trailer or tent will be shelter halves. Large tents should be repaired whenever possible while erected.

h. As there is no permanent storage space provided for repaired articles, it is of first importance that they should be cleared at least once a day to a quartermaster depot for reissue. Neither the battalion nor the salvage repair company has sufficient transportation facilities to move this daily accumulation, and arrangements must be made either with the quartermaster depot or with the motor pool to meet the local situation.

i. (1) It is to be noted that the responsibility for condemning salvage as irreparable rests on the repair sections. Rejection for irreparability will depend largely on the current ease of procurement.

If serious shortages of materials or shipping space develop, articles normally considered economically irreparable will be reclaimed. Hence it is impossible to set up hard and fast rejection factors.

(2) Irreparable articles and other waste materials will be stacked in the open on dunnage and covered when possible with paulins. This dump will be located near the shipping point and will receive the waste from all sections. As in the case of reparable articles, waste materials must be cleared as rapidly as possible through arrangement with the motor pool. It will be shipped to a salvage depot or, if such does not exist, to the base quartermaster.

j. In order that necessary records of the production of the salvage repair battalion may be kept, the salvage repair company should make the following itemized daily reports:

- (1) Articles repaired.
- (2) Articles found irreparable.
- (3) Articles not in need of repair.
- (4) Repaired articles returned to the quartermaster depot.
- (5) Irreparable articles returned to base.

Reports (1), (2), and (3) will be made by each repair section, and (4) and (5) will be made by the personnel assigned to the shipping activities of the platoon. All reports will clear through platoon headquarters and company headquarters to the battalion headquarters for consolidation.

CHAPTER 4

SALVAGE DEPOT

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SECTION I

GENERAL

	Paragraph
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40. Mission.—*a.* The mission of the quartermaster salvage depot in a theater of operations is the reclamation of all property not reclaimed by other services.

b. The duties of the personnel assigned to a quartermaster salvage depot in the theater of operations include:

(1) The prompt renovation and repair, for the purpose of reissue, of all quartermaster equipment and materials worn out or abandoned on the battlefield, in camps, or in bivouacs.

(2) The proper disposal of all unreclaimable property.

(3) The fullest possible exploitation of all captured property of a quartermaster nature.

(4) The collection and dissemination through channels of technical information concerning the proper conservation of quartermaster materials and equipment.

41. Location.—*a.* The location of a salvage depot will usually be in the base section of the communications zone.

b. Before the establishment of such a depot the proposed site should be surveyed in regard to—

(1) *Railroad facilities.*—Railroad sidings are necessary if railroads exist in the zone of communications, as rail shipment of salvage accumulation is most economical and efficient.

(2) *Highway facilities.*—These are essential to supplement railroad facilities, or for all movement of salvage should railroad transportation be lacking.

(3) *Port facilities.*—If the theater of operations is overseas, access to ships is important if large quantities of waste materials are to be returned to the zone of the interior.

(4) *Terrain.*—The site must be suitable for dispersal of buildings, with the necessary intercommunicating roads, and must include space for outdoor storage of large quantities of scrap.

(5) *Power.*—If possible, the depot should derive its power for machine operation, lighting, etc., from local sources.

(6) *Water supply.*—Operation of the depot is dependent on an ample supply of fresh water for laundry purposes.

(7) *Existing buildings.*—The site should be examined for existing buildings that could be efficiently incorporated in the depot.

c. A study should be made of the local labor market to determine what types and quantities of skilled, semiskilled, and unskilled labor are available. On such a study depends the number and kind of labor troops that must be sent from the zone of the interior to operate the depot under the supervision of headquarters.

42. Construction.—*a.* The construction of the depot is a function of the Corps of Engineers.

b. A depot to serve 100,000 men consists of the following buildings:

(1) Administrative and shipping	1 building, 48 by 144 feet.
(2) Receiving and regulating	1 building, 48 by 160 feet.
(3) Machinery and metals	1 building, 48 by 160 feet.
(4) Waste disposal	1 building, 48 by 160 feet.
(5) Laundry and sterilization	2 buildings, 48 by 112 feet each.
(6) Clothing	2 buildings, 48 by 112 feet each.
(7) Canvas and webbing	2 buildings, 48 by 144 feet each.
(8) Shoes, leather, and rubber	2 buildings, 48 by 128 feet each.

c. If it is desired that the depot serve 200,000 troops, buildings listed in *b* (5), (6), (7) and (8) above will be duplicated.

d. Concrete floors are necessary in the laundry and sterilization buildings and are preferable in administration and shipping, machinery and metals, receiving and regulating, and waste disposal buildings. They may be used in other buildings, but as all electrically

operated machinery must be bolted to the floor and concrete is very undesirable for workers who stand at their work, wood floors are preferable in the clothing, shoe and canvas repair buildings.

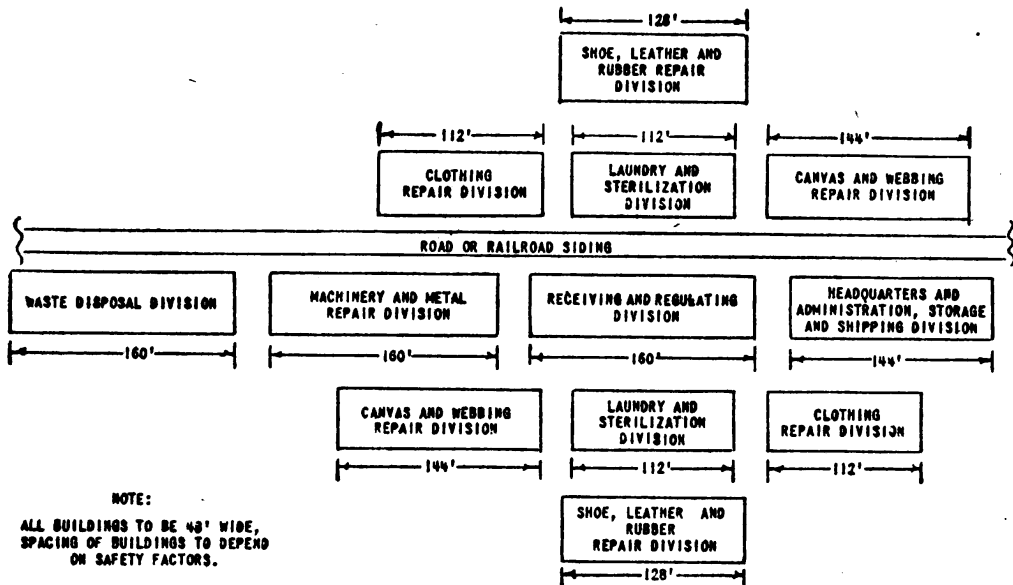


FIGURE 9.—Proposed lay-out for quartermaster salvage depot.

43. Dispersion of buildings.—The danger of aerial attack makes it necessary to decentralize the depot. The various buildings will be dispersed as widely as safety dictates but will be so placed as to insure the most efficient flow of salvage possible. Figure 9 shows a good lay-out for this purpose. It will be noted that each operating division, except the machinery and metal division, occupies widely separated buildings for two reasons: first, because a building capable of housing all the activities of a division would offer too large a target for aerial bombing; and second, it will insure the continuation of repair should one of the buildings be destroyed. The distances between buildings and other safety measures will be determined by the commander of the theater of operations.

44. Flow of salvage.—Incoming salvage will be sorted in the receiving and regulating division and distributed to the laundry and sterilization buildings, or, if washing or sterilization is not necessary, direct to the appropriate repair divisions. The repaired articles are delivered to the storage and shipping division. Irreparable articles and all other waste material go to the waste disposal division.

45. Equipment.—*a.* The equipment and machinery of a salvage depot are not standardized but will be established and procured by The Quartermaster General as circumstances dictate. In type and amount, they will be sufficient to serve 100,000 or more troops by two-shift operation.

b. There are assigned to the depot six 2½-ton trucks with 1-ton trailers, one ¼-ton truck, one ¾-ton truck, command, and one ¾-ton truck, weapons carrier.

46. Personnel.—*a. Military.*—The military personnel assigned to the salvage depot (T/O 10-250) consists of eighteen commissioned officers, one warrant officer, 259 enlisted men, or a total of 278. These constitute the administrative, tactical, supply, mess and supervisory personnel required for the operation of the depot.

b. *Labor.*—Labor personnel will consist of quartermaster service units, civilians, or prisoners of war, and will be secured as needed.

c. *Technical.*—Technical operating personnel, mechanics, operators, repairmen, etc., will be secured as required by the employment of civilians, labor troops, or organizations of special trade units. Prisoners of war should not be assigned to these duties unless the available supply of skilled military or civilian personnel is inadequate.

d. *Civilian.*—(1) Government regulations regarding the employ of civilians must be strictly observed. Especially is this applicable to policies covering sickness and injury. As many as possible of all civilian personnel should be employed on an hourly basis.

(2) As a precautionary measure against sabotage, every civilian employee should be required to display prominently on his or her person, at all times, a distinctive identification device issued by the depot. In addition, and if feasible, the adoption of a special uniform for employees is recommended.

(3) If the depot is situated in or near a center of population, it may be possible to supplement its shop operations by sending out work for hand repair in workers' homes.

47. Organization.—*a.* The Table of Organization (T/O 10-250) of headquarters, salvage depot, includes only the administrative, supply, mess, and supervisory personnel of the depot. It provides complete supervisory personnel for two shifts in each of the repair divisions.

b. The dispersion of buildings, the double shift operation therein, and the probability of the available workers being untrained necessitates a high percentage of supervisory personnel.

c. The depot is divided into 11 divisions of which the following are administrative:

- (1) Depot headquarters.
- (2) Company headquarters.
- (3) Administrative and supply division.

d. The operating divisions are:

- (1) Receiving and regulating division.
- (2) Laundry and sterilization division.

- (3) Clothing repair division.
- (4) Shoe, leather, and rubber repair division.
- (5) Canvas and webbing repair division.
- (6) Machinery and metal repair division.
- (7) Waste disposal division.
- (8) Storage and shipping division.

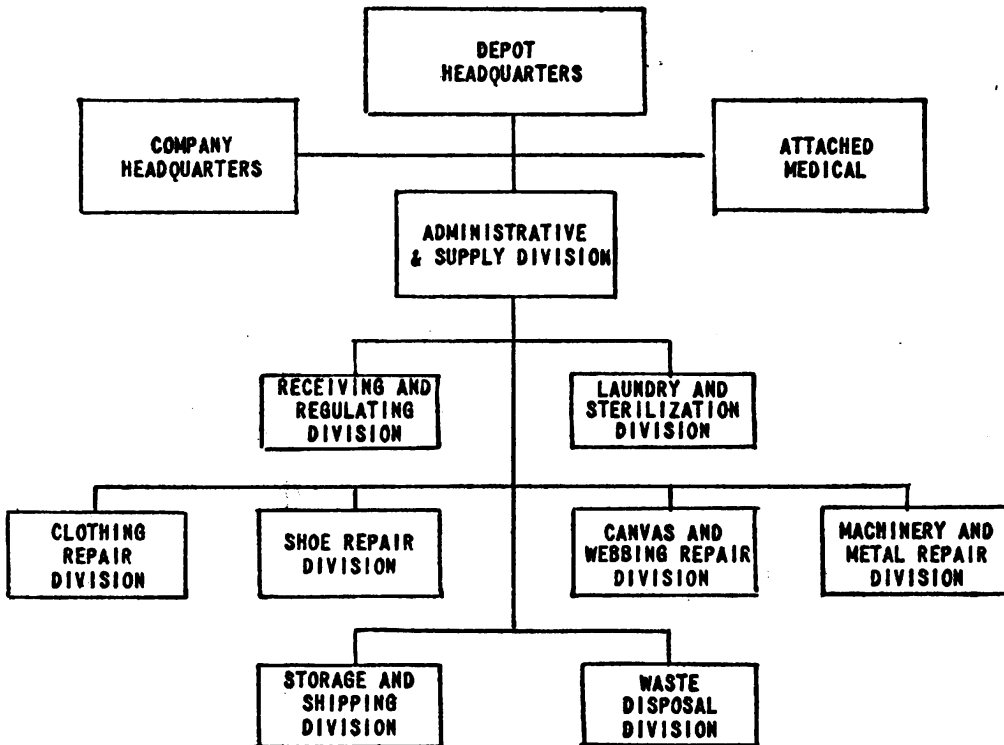


FIGURE 10.—Headquarters quartermaster salvage depot (T/O 10-250).

48. Principles of reclamation.—*a.* The cost of reclamation does not necessarily enter into consideration in the operation of the salvage depot. In time of peace, no justification exists for reclaiming an article for which the cost of reclamation equals or exceeds the original cost. In war, however, when certain articles are not readily obtainable and transportation facilities into the theater of operations are constantly overburdened, such costs can be justified even to the extent of exceeding the original, provided the repair processes restore the items to a suitable condition for reissue.

b. Every effort should be made by the repair personnel of the depot to restore each reparable article to a condition "as good as new." This will be comparatively simple with items of a metallic nature, such as mess gear, tools, utility equipment, etc., but with clothing and other textiles the problem is more complex. It is doubtful if the repair of textiles, especially clothing, should extend beyond the mend-

ing of ripped seams, small tears not easily discernible, and the replacement of missing buttons. If circumstances permit, more extensive repair necessitating unsightly patches should not be made on clothing (except fatigue clothing) destined for reissue to troops. Such garments should be repaired and issued to labor battalions, or dyed a darker shade than olive drab and issued to prisoners of war, or disposed of to relief organizations upon proper authorization from the communications zone commander. Likewise, garments which have shrunk below tariff sizes because of improper washing should not be sent to issuing depots, but should be dyed and disposed of as indicated above. In general, the extent of repair will depend upon how the supply system is functioning, and whether operations are conducted in a domestic or foreign theater.

c. In the course of operations, large quantities of clothing and equipment will accumulate which cannot be put back into service for purposes for which they were originally intended. These should be used to the fullest extent in the repair of other articles of similar nature, and in the manufacture of new articles.

d. Reclaimed property, after inspection, should be packed and marked in accordance with prevailing practices for original packages. This especially applies to clothing, footgear, and other articles where sizes are involved.

SECTION II

DEPOT HEADQUARTERS

	Paragraph
Commanding officer.....	49
Executive officer.....	50
Adjutant.....	51
Chief clerk	52

49. Commanding officer.—*a.* The quartermaster salvage depot is commanded by a colonel who is designated commanding officer, quartermaster salvage depot.

b. The commanding officer of the depot will exercise the customary function of command and will report directly to the chief quartermaster, communications zone. His duties in general are to coordinate the activities of the several divisions of the depot and to carry out the instructions of higher command. He is directly responsible for all activities of the depot

50. Executive officer.—A lieutenant colonel is the executive officer, and as such is second in command of the depot.

51. Adjutant.—The adjutant holds the rank of captain and performs the duties usually associated with that position.

52. Chief clerk.—The chief clerk, a warrant officer, supervises the clerical activities of the depot and acts as personnel officer.

SECTION III

COMPANY HEADQUARTERS

	Paragraph
Function.....	53
Personnel.....	54

53. Function.—The company headquarters is responsible for the company records, mess, supply, and transportation.

54. Personnel.—*a.* The company headquarters is commanded by a captain who is responsible for its activities.

b. The noncommissioned officers are a first sergeant; a staff sergeant, mess; a staff sergeant, supply; and a corporal, company clerk.

c. The technicians include three cooks, grade 4; three cooks, grade 5; and two chauffeurs, grade 5.

d. The privates, first class, and privates consist of bugler and messenger; seven chauffeurs; four cook's helpers; one automobile mechanic; five orderlies; and four basics.

SECTION IV

ADMINISTRATIVE AND SUPPLY DIVISION

	Paragraph
Function.....	55
Personnel	56
Records and reports.....	57

55. Function.—*a.* The administrative and supply division is charged with the administration of all matters pertaining to the coordination of the several divisions of the depot, and is the medium of liaison between the commanding officer and the divisions and branches operating under his direction. It receives, records, and distributes all instructions of higher command, and dispatches replies and acknowledgements thereto. It approves the transfer of employees from one division to another and endeavors to secure the best working arrangement within the depot as applicable to employees' qualifications and comfort. It maintains messenger service and establishes and operates a limited stenographic branch for general service.

b. The supervision, direction, and coordination of operations conducted within the depot bring forth certain administrative functions such as handling of mail and records; internal administration; planning and training; administration of personnel, both military and civilian; handling of fiscal affairs, including budget estimates, allot-

ments of funds, and records of reports and expenditures; and the procurement of supplies for reclamation and maintenance. These functions in the main constitute the duties for which the administrative and supply division is held solely responsible.

c. It is responsible for the receiving, storing, shipping, and requisitioning and accounting for all operating supplies used in reclamation and usual depot maintenance.

d. It is charged with the maintenance and repair of all buildings, grounds, machinery and equipment, and the operation of all plants and systems within the area, such as water supply, sewage disposal, electrical distribution, heating, etc.

e. This division occupies part of the storage and shipping buildings.

56. Personnel.—*a.* The commissioned personnel of this division consists of a major, in charge; and a captain, assistant and utilities officer.

b. A master sergeant acts as general superintendent.

c. The personnel engaged in utilities and maintenance work consists of one technical sergeant, foreman of utilities; one staff sergeant, assistant to the foregoing; and twenty technicians: two blacksmiths, two carpenters, two electricians, two electric plant operators, two stationary steam engineers, six shop maintenance mechanics, one millwright, one painter, and two plumbers.

d. Assigned to work on operating supplies are one technical sergeant; one sergeant; and two storekeepers, one of whom is a technician.

e. The clerical staff consists of the following technicians: two general clerks, three headquarters clerks, one statistician, one stenographer, and five privates: two general clerks and three headquarters clerks.

f. In addition to the above, the following are included in this division: one sergeant, chief watchman; two corporals, assistants to the foregoing; sixteen watchmen; and five basics.

57. Records and reports.—*a.* The administrative and supply division will require daily itemized reports from the operating divisions deemed necessary by the commanding officer to keep the following records for the entire depot:

- (1) Articles received for repair.
- (2) Articles laundered.
- (3) Articles not in need of repair.
- (4) Articles repaired.
- (5) Articles unfit for repair.
- (6) Repaired articles in storage pending shipment.
- (7) Repaired articles shipped.
- (8) Irreparable articles in storage.
- (9) Irreparable articles disposed of.

b. The administrative and supply division will consolidate all reports from other divisions, and will keep such records and render such reports as the commanding officer shall require.

SECTION V

RECEIVING AND REGULATING DIVISION

	Paragraph
Building-----	58
Personnel-----	59
Duties-----	60
Operation-----	61

58. Building.—This division occupies a single building, 48 by 160 feet. This is deemed sufficient for a depot handling the salvage for troops up to 200,000. It should be situated directly on the railroad siding, if the depot has railroad facilities; if not, it should be directly on a metaled highway and should have ample platform space for unloading. A concrete floor is preferable.

59. Personnel.—*a.* The military personnel of this division consists of a first lieutenant, in charge; a technical sergeant, general foreman of the division; one general clerk, technician, grade 5; one headquarters clerk; six salvagemen, supervisors of sorting and distribution of salvage; and one basic.

b. Civilians or labor troops will be assigned to this division as the flow of salvage dictates.

60. Duties.—The receiving and regulating division is charged with the receipt, classification, and distribution to the various repair branches of all articles of quartermaster clothing and equipment received at the depot. Its duties are extremely important, and unless performed with efficiency, dispatch, and ingenuity, the whole depot system is endangered.

61. Operation.—*a.* After salvage is unloaded from cars and trucks it will be sorted and tallied in. The pockets of each garment received should be thoroughly searched by the sorter. All matches should be removed and destroyed, and any articles of value should be turned over to the officer in charge of the division, who should make every effort to locate the owner. Also, all uniform insignia, both metal and chevron, should be removed in this division before routing uniforms through for repair. This insignia should later be reclaimed for reissue.

b. Articles which do not require washing or sterilization, such as tentage, paulins, metals, etc., will be sent direct to the appropriate division for decision there as to reparability. No attempt should be made by receiving and regulating division personnel to determine

the economic reparability of an article. That is a function of the repair branch concerned. This division should confine its activity solely to the classification of each item received in order that it may be sent to the proper repair branch.

c. All clothing, shoes, blankets, etc., will be sent to the laundry and sterilization division. These will be distributed between the laundry and sterilization buildings in such proportions and in such straight loads as the laundry officer may direct.

d. Each carload of salvage received at the depot should be examined for gas contamination, visually and by odor. As no dependable devices for readily detecting the various gases selectively are known, it will be necessary to rely mainly on the sense of smell; for this reason certain depot personnel should be trained not only to detect the various gases but also to judge the severity of the contamination.

e. The functions of the quartermaster salvage depot should be generally restricted to the repair of quartermaster clothing and equipment. However, in the course of operations, many items identified with other arms and services will be received. These should not be repaired, but should be held in one of the bins of the receiving and regulating division and at periodic intervals shipped to the salvage depots of the arms or services concerned.

f. At the end of each working period, all employees should be required to leave by one exit, at which should be stationed the officer in charge or his accredited representative, for the purpose of inspecting all packages carried out by the employees. Any attempt to remove Government property should result in the immediate dismissal of the employee concerned. This applies to all depot units.

SECTION VI

LAUNDRY AND STERILIZATION DIVISION

	Paragraph
Buildings	62
Personnel	63
Duties	64
Operation	65

62. Buildings.—This division occupies two buildings, each 48 by 112 feet. If the depot is to serve 200,000 troops, four such buildings will be required. These buildings should be situated as near as possible to the receiving and regulating division, but on opposite sides. Concrete floors are necessary.

63. Personnel.—*a.* The military personnel of this division consists of a captain, in charge; a lieutenant, his assistant; two technical sergeants, each in charge of laundry operations in a building; two

technical sergeants, in charge of sterilization operations in a building; two sergeants, who relieve the technical sergeants of laundry operations on the second shift; two sergeants who relieve the technical sergeants of sterilization operations on the second shift; four clerks two of whom are technicians, grade 4, and one a technician, grade 5; twelve foremen, technicians, grade 5 (three for each shift in each building), who supervise the work of laundry operations; four foremen, technicians, grade 5 (one for each shift in each building), who supervise the work of the sterilizer operatives; and two basics.

b. The number of civilian employees or labor troops assigned to this division will be determined by the quality of the labor and the flow of salvage.

64. Duties.—The laundry and sterilization division is charged with the sterilization and the laundering of all items of salvage that require such treatment, and their routing to the appropriate division for repair. As most of the repair work of the depot depends on the steady flow of salvage through this division, the efficiency of its operation is of the greatest importance.

65. Operation.—*a.* This division calls on the receiving and regulating division for articles to process in such quantities as it can handle, and of such types as may be most needed for reissue at the moment. When salvage is present in sufficient quantity, greater efficiency will be attained if it is handled in straight runs of one type of article at a time.

b. Articles are loaded first into the sterilizers. (For detailed operation see par. 31*e*, *f.* and *g.*) After sterilization, they are placed in turn in the washing machines, the extractors, and the dry room tumblers. (For detailed operation see par. 35*c* to *g*, incl.)

c. The washed and sterilized articles are then sent to the appropriate division for repair.

d. The supervisory and labor personnel in the organization will have sufficient knowledge of repair processes to begin operation without undue difficulty. The details of repair and the limits thereof can be readily developed from the experience gained from handling thousands of items daily.

e. Such daily reports as the commanding officer deems necessary will be made to the administrative officer by each repair division.

SECTION VII

CLOTHING REPAIR DIVISION

	Paragraph
Buildings -----	66
Personnel -----	67
Duties -----	68
Operation -----	69

66. Buildings.—This division occupies two buildings, each 48 by 112 feet. If the depot is to serve 200,000 men, four such buildings will be required. These buildings should be situated as near as possible to the laundry and sterilization buildings, as all of the articles they repair are drawn from that division. Wood floors are desirable, as machines are bolted down.

67. Personnel:—*a.* The military personnel of this division consists of a captain, in charge; a lieutenant, his assistant; two technical sergeants, each in charge of one clothing repair building; two sergeants, each in charge of a second shift in one clothing repair building; one general clerk, technician, grade 4; three headquarters clerks, of whom one is a technician, grade 4, and one a technician, grade 5; twenty-four foremen technicians, grade 5, six to each shift, who supervise the operatives' work as follows: one for initial examination and marking, two for machine work, one each for hand work, pressing, final examination, and baling; and two basics.

b. The number of civilian employees or labor troops assigned to this division will depend upon the quality of the labor and the flow of salvage.

68. Duties.—The clothing repair division is charged with the reclamation of all items of a textile nature with the exception of canvas and webbing. As these items constitute approximately one-half of the depot's receipts, it is obvious that the highest degree of shop efficiency in proper viewing, marking, routing, and workmanship must be attained and proper coordination of all sections of the division achieved, in order to insure a rapid rate of repair and prevent the accumulation of salvage.

69. Operation.—*a.* Clothing and other articles are received from the laundry and sterilization division. After being tallied in, the articles are examined and marked for repair. Those found irreparable are segregated for delivery to the waste disposal division after being stripped of all serviceable materials.

b. After being marked for repair, the items are distributed to the appropriate sections where repairs are accomplished.

c. The repaired articles are then inspected and if insufficiently or improperly repaired, they are immediately returned to the repair section responsible; if satisfactory, they go to the steam presses.

d. After the pressing process, articles requiring sizing are sized and properly marked. They are then carefully folded and piled according to size and item until a quantity sufficient for baling has accumulated, when standard bales are made, properly marked, and sent to the storage and shipping division. (For suggested detailed operation see app. II.)

SECTION VIII

SHOE, LEATHER, AND RUBBER REPAIR DIVISION

	Paragraph
Buildings.....	70
Personnel.....	71
Duties.....	72
Operation.....	73

70. Buildings.—This division occupies two buildings, each 48 by 128 feet. If the depot is to serve 200,000 troops, four such buildings will be required. As in the case of the clothing repair division, this division will draw its salvage from the laundry and sterilization division, and each of its buildings should be situated as near as possible to one of the laundries. Wooden floors are desirable.

71. Personnel.—*a.* The military personnel of this division consists of a captain, in charge; a lieutenant, his assistant; two technical sergeants, each in charge of one shoe repair building; two sergeants, each in charge of the second shift in one shoe repair building; one general clerk, technician, grade 4; three headquarters clerks, one of whom is a technician, grade 4, and one a technician, grade 5; twenty foremen, technicians, grade 5, five for each shift, to supervise the following operatives: jackmen, machine operators, rubber patchers, saddlers, pairers; and two basics.

b. The number of civilian employees or labor troops in this division will be determined by the quality of the labor and the flow of salvage.

72. Duties.—The shoe, leather, and rubber repair division is charged with the reclamation for reissue of all items of leather issued in the theater of operations, also with the reclamation of rubber boots, arctics, and raincoats. Shoes will constitute probably 80 percent of the articles repaired by this division.

73. Operation.—*a.* After sterilization, shoes are examined for reparability. Shoes that are so badly damaged that their repair is beyond the facilities of this division will be returned to the zone of the interior, where army shoe-rebuilding plants are situated.

b. After examination, the shoes are paired, every effort being made to mate them according to size, appearance, condition, and make. Unless shoes are properly mated at this point they will be thrown out

on final inspection and sent back for remating. Great emphasis must be given to the proper performance of this operation.

c. Properly mated shoes are placed side by side on shoe racks and taken to the jackmen, who replace old heels and soles with new and prepare the shoes for the stitchers.

d. The soles are stitched on and the shoes turned over to the finishing line where the soles are trimmed, the heels scoured, and a general "touching up" process is accomplished. Many of the shoes will require sewing of ripped seams and other repairs to the uppers, which are effected by the patching machines.

e. If shoes have been washed, much of the natural oil of the leather has been removed. Unless this is restored the leather becomes hard and brittle and possesses little ability to resist the penetration of moisture. Therefore, before inspection, the shoes are treated with a leather preservative.

f. After the foregoing operations, the shoes are thoroughly inspected and those found faulty are returned for correction. Properly repaired shoes are delivered to the markers, who check sizes and stamp the proper size on the shoe. New strings are supplied, missing eyelets replaced, heel pads inserted, and each pair is tied together, heel to toe, with soles facing outward. (For more detailed instructions on shoe repair see app. I.)

g. Harness and saddlery is not washed or sterilized prior to receipt by this division. It is sponged in a white soap lather, saddle-soaped, dried, and oiled. Missing parts are replaced and other necessary repairs accomplished.

h. Leather gloves, received from the laundry and sterilization division, are treated with saddle soap; rips and seams are repaired, and the gloves are carefully sized before packing.

i. Rubber boots and arctics will be washed by hand and disinfected with sodium hypochlorite in this division. Uppers are repaired by "cold patching" and half soles are applied with cement.

j. All repaired articles will be packed in straight packages, properly marked, and delivered to the storage and shipping division. Whether packed in boxes, cartons, bundles, or bags, will be determined by local conditions.

SECTION IX

CANVAS AND WEBBING REPAIR DIVISION

	Paragraph
Buildings	74
Personnel	75
Duties	76
Operation	77

74. Buildings.—This division occupies two buildings, each 48 by 144 feet. If the depot is to serve 200,000 troops, four buildings will be required. Proximity to the laundry and sterilization buildings is not important, as little of the salvage for repair is drawn from that division. Wooden floors are preferable for these buildings, which should be so constructed as to permit the hoisting of large tents. Tents weighing up to 125 pounds will be hoisted from one point, and those weighing from 125 to 340 pounds will be hoisted from two to three points 16 feet apart.

75. Personnel.—The military personnel of this division consists of a captain, in charge; a lieutenant, his assistant; two technical sergeants, each in charge of one building; two sergeants, each in charge of the second shift in one building; two general clerks, one a technician, grade 4; two headquarters clerks; twenty technicians, grade 5, five to each shift, who supervise the operatives' work as follows: one each for examining and marking, tent repair, sewing machines, raincoats, inspection and packing; and two basics.

76. Duties.—The canvas and webbing division is charged with the reclamation of tentage, paulins, leggings, and other canvas items, webbing equipment, and raincoats.

77. Operation.—*a.* In this division large tents are raised by means of an overhead block hoist for examination and marking; holes and cuts are repaired by either sewed or cemented patches; rips are sewed; and missing or defective component parts, such as grommets, lines, rings, etc., are replaced. After repair, tents are again hoisted for examination. Serviceable component parts are stored for future use.

b. Shelter halves, leggings, and webbing equipment, after being marked, are repaired on the sewing machines; missing or defective hardware is replaced, and a final inspection made. Leggings are sized, paired according to size and general appearance, and marked with the proper size.

c. Raincoats will be washed by hand, if dirty. After washing, they are hung on racks for drying. Rubberized coats are repaired by means of cement patches, oilskins by sewing. After repair, raincoats are treated, when necessary, with a waterproofing compound applied with

a brush; missing or broken buckles are replaced, and a final inspection is made.

d. Large tents are folded in accordance with instructions in FM 21-15. Shelter halves are baled; leggings and webbing are packed in boxes. When packed, all articles are delivered to the storage and shipping division.

SECTION X

MACHINERY AND METAL REPAIR DIVISION

	Paragraph
Building-----	78
Personnel-----	79
Duties-----	80
Operation-----	81

78. Building.—This division occupies one building, 48 by 160 feet. This affords sufficient space for a depot serving up to 200,000 troops. This building should be situated on the same siding or road as the receiving and regulating building, the waste disposal building, and the storage and shipping building, as the salvage handled is bulky and heavy and should be moved only the shortest possible distances. The building should have a concrete floor.

79. Personnel.—*a.* The military personnel of this division consists of a lieutenant, in charge; one technical sergeant, superintendent of the shop; one sergeant, superintendent of the second shift; one general clerk, technician, grade 5; one headquarters clerk; eight foremen, technicians, grade 5, four per shift, who supervise the following operatives: woodworking, machine shop, foundry, and sheet metal; and two basics.

b. The number of civilian employees or labor troops assigned to this division will depend on the type of labor and the flow of salvage.

80. Duties.—The machinery and metal repair division is charged with the reclamation of machinery and metal articles issued by the Quartermaster Corps. It also repairs cots and wooden articles, fabricates spare parts for the depot machines, and manufactures such items for the upkeep of the depot as its equipment permits. Mess equipment, helmets, cots, and tools will constitute the major part of its output.

81. Operation.—*a.* This division handles such a variety of articles that it is impracticable to specify repair processes for each item or to outline a flow of work.

b. The woodworking section, in addition to repairing wooden articles, will construct tables, benches, shelving, etc., which becomes necessary for the operation of the depot, and will manufacture and repair shipping boxes for the other repair divisions. In this con-

nection, all boxes received by the receiving and regulating division will be sent to this section.

c. The machine shop will be used, when appropriate, in repair work on metals and machinery, and its facilities will be employed in shop and utilities maintenance.

d. The sheet metal section, with its welding facilities, will function in the repair of many articles, especially mess equipment and steel helmets. Such painting of metals as is necessary will be accomplished in this section.

e. In the foundry section, which includes a blacksmith shop, tools will be sharpened and hardened, articles will be cast from scrap metals, and numerous special services will be performed.

SECTION XI

STORAGE AND SHIPPING DIVISION

	Paragraph
Building.....	82
Personnel.....	83
Duties.....	84
Operation.....	85

82. Building.—This division occupies, together with the depot headquarters, company headquarters, and administration and supply division, one building, 48 by 144 feet, which is deemed sufficient for a depot serving up to 200,000 troops. The building must be situated on a railroad siding, or main road if the siding is lacking. It should be provided with a cement floor.

83. Personnel.—*a.* The military personnel of this division consists of a first lieutenant, in charge; one technical sergeant, supervisor of warehousing and shipping; two general clerks, one of whom is a technician, grade 5; two headquarters clerks; one warehouseman, who is in charge of storage, and one basic.

b. The number of civilian employees or labor troops assigned depends on the amount of repaired articles to be stored or shipped.

84. Duties.—The storage and shipping division is charged with the receipt of repaired articles from the repair divisions, their storage and eventual shipment to quartermaster depots for reissue.

85. Operation.—*a.* If sufficient motor or rail transportation is available, this division will clear its warehouse of repaired goods each day; however, this will not often be the case, and at times there will be a considerable accumulation awaiting shipment.

b. Every effort must be made to keep such accumulations to a minimum. Close contact with the motor pool and the railroad authorities must be maintained at all times to insure the prompt return of

repaired articles to service. The constant effort to achieve this end has been kept up from the front lines, through the salvage collecting companies, during long hauls to the base, and through the repair divisions of the depot and must not meet a final bottleneck in this division.

c. The storage of repaired articles awaiting shipment will be in accordance with instructions contained in TM 10-250.

d. Shipments will be made to destinations as directed by the commanding officer, the tally and reports being made daily to the administrative officer.

e. It is believed that this division can operate efficiently on a one-shift basis, and personnel has been supplied accordingly.

SECTION XII

WASTE DISPOSAL DIVISION

	Paragraph
Building-----	86
Personnel-----	87
Duties-----	88
Operation-----	89

86. Building.—This division occupies one building, 48 by 160 feet, which is deemed sufficient for a depot serving up to 200,000 troops. It must be situated directly on the road or railroad siding, as it will both load and unload straight cars of waste materials. It should be at one end of the depot and have ample space around it for outdoor storage. A concrete floor is desirable.

87. Personnel.—*a.* The military personnel of this division consists of a first lieutenant, in charge; one technical sergeant, supervisor of operations; one general clerk, technician, grade 5; one headquarters clerk; four salvage men to supervise the classification and handling of waste materials in the building and yards; and one basic.

b. The number of civilian employees or labor troops assigned to this division will probably be large but will be determined by the flow of salvage.

88. Duties.—The waste disposal division is charged with the disposal of waste materials and irreparable articles which result from the operations of the depot, or which may be received direct from other arms and services.

89. Operation.—*a.* Waste materials are received from all the repair divisions of the depot and also direct from other arms and services.

b. Salvage will be classified according to materials as local markets or demands from the zone of the interior dictate. Bales and other packages will be made as compact as possible.

c. Materials that require protection from the weather will be warehoused in buildings in accordance with the principles of warehousing recommended for the storage division.

d. An area for the open storage of irreparable property and waste materials will be provided for the waste disposal division. Scrap metal, lumber, barrels, boxes, bulk machinery, etc., which are not appreciably affected by the weather, can be stored in this area, thereby conserving covered storage space for items requiring greater protection for adequate preservation. Materials stored in the open should be segregated by items and covered with tarpaulins if necessary.

e. Cotton rags, suitable for wiping rags, may be retained for use in the depot, or delivered on orders of the commanding officer to arms or services that request them. Other waste suitable for Army use may be similarly issued.

f. The final disposition of waste materials depends entirely on local conditions in the theater of operations and the demand for them in the zone of the interior. It is probable that in certain theaters of operations there will be factories in great need of raw materials to produce necessities for the Army. In such cases it would be more advisable to sell metal, wool, or other scrap locally than to return it to the zone of the interior. On the other hand, should the zone of the interior be in serious need of such scrap, or if local markets should not exist, waste materials will be sent to the zone of the interior.

g. (1) Some of the materials received by the waste disposal division will be manifestly useless, worthless, and of no salable value. These should be listed in duplicate, properly certified by the depot commander, and destroyed under the supervision of a disinterested officer.

(2) In time of war it is particularly important that the worthlessness of any property be carefully considered before destruction is authorized. Every effort should be made to use it in some manner beneficial to the Government.

CHAPTER 5

OTHER SALVAGE OPERATIONS

	Paragraphs
SECTION I. General.....	90-93
II. Salvageable waste	94-97

SECTION I

GENERAL

	Paragraph
Final disposal of waste.....	90
Principle of waste conservation.....	91
Study of markets.....	92
Responsibility for salvage of waste.....	93

90. Final disposal of waste.—The specific materials to be salvaged from waste will depend on local needs in the theater of operations and on the demand for materials that are critical in the zone of the interior. General rules as to the kind of waste to be salvaged cannot be laid down, as local conditions will vary not only in different theaters of operations but at different times in the same theater of operations. Furthermore, the shipment of waste materials to the zone of the interior will depend on how critical such materials are at the moment and on the availability of transportation.

91. Principle of waste conservation.—In time of war nothing should be wasted; everything having the slightest value in the war effort must be saved and used in furthering that effort.

92. Study of markets.—A careful and thorough survey must be made in each theater of operations of the local markets and of the possible utilization of all forms of waste. The greatest ingenuity and resourcefulness must be employed by salvage officers to get the last ounce of use out of each piece of material in the hands of the Army.

93. Responsibility for salvage of waste.—If a salvage depot exists at the base, the disposal of waste will generally be handled by that organization, with the exception of grease, fats, paper, and dead animals. If no depot exists, waste will be sold or shipped to the zone of the interior under supervision of the base quartermaster on instructions from the commanding general.

SECTION II

SALVAGEABLE WASTE

	Paragraph
Metals	94
Textiles and rubber	95
Food waste	96
Miscellaneous waste	97

94. Metals.—Nonferrous metals will always be salvaged and ferrous metals will usually be salvaged. The degree of classification and method of final disposition will be determined by current conditions.

95. Textiles and rubber.—Rags of wool, cotton, knit goods, canvas, webbing, and burlap will always be salvaged, as will scrap rubber and scrap materials containing rubber.

96. Food waste.—Grease, fats, bones, and raw meat scraps from messes will be salvaged when practicable. If conditions permit, edible garbage other than the above materials will be sold locally for hog feed.

97. Miscellaneous waste.—Local conditions in the theater of operations and demand in the zone of the interior will determine the extent of salvage of rope, leather, glass, barrels, boxes, and paper. When practicable, dead animals will be disposed of by local sale, either in original state or after skinning and dismemberment. There is no part of a dead horse that cannot be put to valuable use; the mane, tail, hair, hooves, bones, skin, rendered grease, and dry-rendered flesh can all be utilized.

APPENDIX I

SHOE REPAIR METHODS FOR QUARTERMASTER REPAIR SHOPS

	Paragraph
General.....	1
Preparation of materials.....	2
Removal of old materials.....	3
Preparation of shoes.....	4
Application of materials.....	5
Finishing operations.....	6

1. **General.**—The repair methods presented in the paragraphs below are prescribed for the repair of Army service, garrison, and dress shoes in quartermaster repair shops. Shop officers will be responsible for the observance of prescribed methods by shop personnel.

2. **Preparation of materials.**—It is essential that an adequate supply of materials be ready for use and available at all times, in order to insure an uninterrupted flow of work. Therefore, taps, middle soles, and heel bases must be properly prepared prior to their application to shoes.

a. *Leather taps.*—(1) *Skiving.*—Leather taps are usually skived by means of a tap-skiving machine. The butt end of the tap is passed through the two rollers of the machine, which brings the tap in contact with the cutting blade. The screw attachment on the machine, which permits adjustment of the cutting depth of the blade, should be adjusted to provide for a skive sufficiently thick to hold nailheads securely.

(2) *Sanding.*—Before rubber cement is applied to a leather tap, the entire surface to which the cement is to be applied will be well sanded with a coarse abrasive.

(3) *Cementing.*—An even coating of rubber cement will be applied to the sanded surface of the leather tap. Care will be taken not to apply a coating of excessive thickness.

(4) *Tempering.*—(a) *General.*—The proper tempering of leather taps is one of the most important steps in the preparation of materials, since tempered taps are more readily shaped to conform to the shape of shoes and are more easily stitched and finished.

(b) *Method.*—Leather taps will be soaked in water from 10 to 15 minutes. The taps will then be removed, drained, wrapped in dampened burlap, and placed in a container sufficiently inclosed to retain the humidity for from 12 to 24 hours. Leather may be kept “in

temper" for longer periods if desired, provided the burlap is maintained in a dampened condition.

b. Middle soles.—Middle soles are usually cut from shoulder leather supplied for that purpose. When cutting middle soles, care must be exercised to avoid wastage of material.

(1) *Cutting method.*—It is recommended that middle soles be cut in two sizes, large and small, from patterns obtained by using middle soles removed from repaired shoes. After the soles have been cut, they will be passed through the splitting machine, which should be adjusted to deliver a 7-iron thickness. (1 iron = $\frac{1}{48}$ inch.)

(2) *Scraps and skivings.*—Small pieces of leather which remain from sole cutting, if of sufficient size, will be used for heel bases. Skivings used in the repair of middle soles may also be made from such cuttings.

c. Heel bases.—(1) *General.*—Heel bases are cut from shoulder leather into strips of two widths, 3 inches and $3\frac{1}{4}$ inches wide, respectively. Each strip is then passed through the splitting machine, which should be adjusted to deliver a 7-iron thickness.

(2) *Cutting method.*—From these strips heel bases will be cut in two sizes. A size 10–11 heel will be used as a pattern for bases obtained from the 3-inch strips, and a size 12–13 heel for bases obtained from the $3\frac{1}{4}$ -inch strips.

3. Removal of old materials.—*a. Heels.*—Heels will not be removed unless they are worn down below an over-all height of $\frac{3}{4}$ inch, including the leather base. Heel pads will be removed at the same time. Nail holes will be plugged with $\frac{5}{8}$ -inch wooden pegs.

b. Soles.—(1) *Determination of cutting line.*—A new tap of appropriate size will be used as a pattern to determine the point to which the old sole should be cut. The tap used as a pattern will be placed on the shoe in such a manner that it completely covers the area to be repaired. A line is then drawn with a knife or other suitable device across the shank of the shoe, using the butt edge of the pattern tap as a guide. A second line, parallel to this line, is then drawn across the shank, 1 inch forward toward the toe of the shoe. This forward line is the line at which the old sole will be cut.

(2) *Cutting method.*—After the cutting line has been determined, a knife is inserted between the outer and middle soles at a convenient point near the toe of the shoe and then forced completely around the edge of the old sole, cutting the threads up to the cutting line on each side of the shoe. The old sole will then be cut off along the cutting line.

(3) *Skiving.*—The area between the parallel lines previously drawn on the shank of the shoe will be skived so that a perfect union between

the skived portion of the old sole and the skived portion of the tap may be obtained. It is important that care be exercised in the skiving operation, since the removal of all excessive amount of leather will tend to weaken the skived joint to the point where nails will fail to hold.

(4) *Full soles*.—If shoes require the application of full soles, the old sole will be entirely removed.

4. Preparation of shoes.—After old heels and soles have been removed a number of preparatory operations essential to the application of new materials must be performed.

a. Repair and replacement of welts.—The replacement or reinforcement of welts is important, since soles cannot be properly attached to welts that are loose or in need of replacement. Welt replacement will be accomplished by ripping the stitching and cutting off the portion of the welt to be replaced. The welt ends remaining on the shoe will be beveled to match the bevel made on the new welt, which will be cut to the required length. The new welt will then be set in place and attached by using a hand-sewing awl, thread, and bristles. For the first stitch, a hole is made with the awl through the insole (lip of insole, upper and old welt) approximately $\frac{1}{4}$ inch from the end of the bevel. One bristle is inserted from the inside of the insole, thus leaving the thread knot in the filler portion of the shoe. A second hole is made through the insole and the end of the new portion of welt. The bristles are then inserted from opposite sides of this hole and the thread is tightly drawn. Similar stitches are spaced $\frac{1}{4}$ inch apart until the new portion of welt is securely attached. When the last stitch is made the outside bristle is passed through, making a half stitch. The thread is then knotted and the unused portion of the thread cut off. Finally the new welt is tapped lightly with a hammer to fuse it properly with the old welt.

b. Sanding.—The shoe bottom will be sanded at all points where new materials are to be applied.

c. Brushing welts.—All particles of sand and dirt will be removed from the welt as well as from the bottom. Failure to remove such particles causes excessive wear on the stitchers. To brush welt on machines equipped with a welt brush, the shoe is held to the welt brush and the brush is allowed to follow along the welt edge, thus removing all particles of sand and dirt. If the machine is not equipped with a welt brush, the brushing will be done with a hand brush.

d. Cementing shoes.—An even coating of rubber cement will be applied to the shoe bottom after it has been thoroughly sanded. The amount of cement applied should not be in excess of that necessary for proper adhesion. Cemented surfaces should not be allowed to

dry before being placed together, otherwise the parts will not adhere properly.

e. Insoles.—Insoles which have curled, particularly at the toe or around the edges, will be flattened by pouring a small amount of water into the shoe to dampen the insole, placing the dampened shoe on a last, and carefully tapping the affected area with a hammer.

5. Application of materials.—The greatest care must be exercised in the application of materials. Improper or careless application cannot be corrected in the finishing process and often results in the shoe being uncomfortable or unwearable.

a. Replacing bottom filler.—If the bottom filler of a shoe has been worn through, a piece of scrap leather will be cut and fitted into the worn place.

b. Attaching middle soles.—Middle soles worn at the toe will be repaired by using skiving which is cut and fitted into the worn place. If worn beyond repair, the middle sole will be replaced with a new sole.

c. Attaching soles.—(1) *Shaping.*—Shaping, which consists of bending the tempered tap both lengthwise and crosswise so as to make it slightly cupped in form, will always be done prior to application of a tap. Shaping is important, as it simplifies succeeding operations and is essential to the production of a durable and comfortable repaired shoe.

(2) *Nailing shanks and toes.*—In securing the tap to the shank, two rows of nails will be placed across the shank, the nails being spaced not more than $\frac{5}{8}$ inch apart, those of one row placed opposite the spaces in the other row. The toes will be reinforced with three nails placed $\frac{5}{8}$ inch apart and $\frac{1}{2}$ inch from the edge.

(3) *Pressing welts.*—In order that the stitching may be properly done, the welt and the sole must be firmly cemented together. To insure proper adhesion the shoe should be held, sole down, on a solid surface, and a smooth tool, such as a heel remover, should be drawn around the welt exerting downward pressure; or the shoe should be reversed, the welt against the edge of a last, and the edge of the sole should be tapped with a smooth-faced hammer.

d. Rough rounding.—When available, a thorough rounding machine will be used to remove superfluous soling material. The machine contains a chisel-shaped knife which cuts the material as it is fed. The edge gage of the machine should be regulated to prevent cutting too deeply. The shoe must not be held at an angle during the cutting operation, as this causes the cutting knife to damage the welt or sole, making the stitching operation difficult if not impossible. The shoe should be allowed to feed automatically and should not be force-fed.

The hand sole-trimming machine will be used when a rough rounder is not available. The welt edge of the shoe should be used as a pattern guide and held against the circular knife blade, which is turned by the hand crank; if a sole requires closer trimming after the rounding operation, a lip knife should be used.

e. Stitching.—Sole stitching must be performed by an experienced operator who is able to adjust the machine properly. Proper adjustment methods are prescribed in the instruction books furnished by the manufacturers of the machines. The stitches used for sewing Army service shoes should be spaced 6 or 7 to an inch, if leather is used for soling, and 5 or 6 to an inch, if composition or corded rubber is used. The lock of the sole-stitching should be drawn with proper tension $\frac{1}{16}$ inch below the surface of the sole. Stitching should be uniform and spaced not more than $\frac{1}{8}$ -inch from the edge of the sole after trimming. Whenever possible, the edge gage and the feed adjusting lever should be set to allow the stitches to follow the old stitch holes in the welt. An improperly set edge gage may result in sewing into the inseam which will cause the welt to pull away from the upper.

f. Heel attaching.—If rubber heels measure less than $\frac{7}{8}$ -inch in the back and $1\frac{1}{16}$ -inch in the front, heel bases will be inserted to make them the proper height. Heels will be attached to the shoe with nails of proper length to clinch firmly and smoothly. Heels will be carefully fitted to the shoes so that the heel scourer may produce a smooth edge.

6. Finishing operations.—*a. Edge trimming.*—Successful edge trimming depends largely on properly tempered leather and a keen cutter edge. To insure a smooth trim, the cutter must be properly sharpened and have the correct angle. The angles of new cutters are scientifically correct and should be maintained when cutters are resharpened. To insure maintenance of this angle, the post on which the cutter is held while being resharpened should be adjusted as the blade wears away. In trimming edges, lightness of pressure and lack of tension in the wrist motion of the operator are necessary to obtain a successful result.

b. Heel scouring.—Heels are scoured by holding them against the sanding wheel and turning them with a continuous motion from one corner of the heel to the opposite corner. Care must be exercised to avoid excessive scouring, as this will ruin the contour of the shoe. When heel bases or leather heels are used, it is necessary to scour the breast of the heel. This is held against the breasting wheel until an even shape is produced.

c. Shank sanding.—The shank is sanded by holding the shoe against the sanding wheel so that a smooth joint is made between the shank and the tap. Care will be exercised to avoid sanding off the nail heads, as such action destroys the holding power of the nails.

d. Sole leveling.—The open channel on the stitched leather sole is closed by pressing the sole against the bottom leveler on the finishing machine.

e. Inking.—The heel and sole edges will be brushed lightly with burnishing ink, a fluid mixture containing a stain and wax which acts as a water repellant. Excessive brushing will be avoided, as it removes the wax from the surface to be protected. Before burnishing, the ink should be allowed to dry thoroughly.

f. Burnishing.—The cloth cover of the burnishing wheel will be impregnated with burnishing wax. The edges of the soles and heels will be held against the wheel to fill the pores of the leather with wax, which makes them water repellant.

g. Edge setting.—Sole edges will be set by applying the edge of the sole to the revolving edge iron on the finishing machine. The shoe is moved backward and forward, considerable pressure being used to effect compression of the edge. This pressure and the friction of the iron effectively seals the edge. The size of the edge iron used will be the same as that of the cutter used for the edge trimming operation.

h. Brushing.—Shoes will be brushed thoroughly to enhance the appearance of the finished job. If a higher luster is desired, pressure of the shoe against the brushes is eased.

i. Miscellaneous.—Missing eyelets will be replaced by use of the eyelet set. When eyelet holes are stretched beyond their original diameter they will be reinforced by sewing on the patching machine. Rips will be repaired on the same machine. Missing heel pads will be replaced with new pads, which must be firmly cemented in place. All shoes will be inspected for protruding and improperly clinched nails.

APPENDIX II

CLOTHING AND TEXTILE REPAIR METHODS

	Paragraph
General.....	1
Sizing.....	2
Repair of clothing.....	3
Repair of canvas and webbing.....	4

1. **General.**—*a.* The speedy return to a completely serviceable condition of articles needing repair is of primary importance and every means will be used for its accomplishment.

b. Due to the variety of repairs necessary for clothing in the theater of operations, it is impractical to attempt to describe methods of repair for all possible damages to individual articles. A method of repair will be given for the most usual damages and those common to all articles, such as ripped seams, tears in the fabric, holes, and the replacement of missing or worn parts.

c. Ripped seams will be re sewn with the single-needle sewing machine where possible, otherwise by hand. Torn buttonholes will be remade by hand.

d. Tears will be mended by either the darning machine or the single-needle sewing machine. When the latter is used, the edges of the tear will be brought together and sewn through a supporting fabric on the inside of the article. Where machine repair is impractical hand repair will be effected.

e. Holes will be either darned or patched. Patches will be cut in either square or rectangular shapes from similar or matching material. They will be sewn on the outside of the garment, with the raw edges turned under.

f. Missing parts will consist chiefly of buttons, which will be replaced, using the button-sewing machine for this purpose. In the event that a unit part of the garment must be replaced, such as sleeve, collar, etc., the worn part will be removed and pressed flat; a similar part will then be cut from a matching material, using the removed part as a pattern. The new part will then be made and attached to the original garment. In patching and replacement of missing parts usable parts of matching or similar articles declared irreparable should be used.

g. When zippers are replaced, they should be re sewn in the original seam if possible. Care should always be taken to allow sufficient opening for a free passage of the slide-locking device.

h. Pockets of all garments, especially trousers and breeches, will be examined, and all ripped or worn parts resewn or replaced.

i. In any sewing operation, either by machine or hand, several back stitches should be made at both the beginning and the end of the seam to prevent the main stitches from becoming loose.

2. Sizing.—All articles requiring sizing will be sized before packing in accordance with table below.

Garment	Size	Full Bust	Measurements in inches				Collar	Sleeve	Remarks
			Neck	Inside Sleeve	Outside Sleeve	Arm			
Blouse, wool, service	33	36	27-1/2	16-1/2	17	17	12	36	This garment is cut 3 inches over given size; i.e., else 33 measures 36 inches around the breast.
	34	37	28	17	17-1/4	17	12	37	Extra long: Body length 3 inches longer and sleeves 2 inches longer than regular.
	35	38	28-1/2	17-1/4	17-1/4	17	12	38	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
	36	39	29	17-1/4	17-1/4	17	12	39	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
	37	40	29-1/2	17-1/4	17-1/4	17	12	40	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
	38	41	30	17-1/2	17-1/2	17	12	41	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
	39	42	30-1/2	17-1/2	17-1/2	17	12	42	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
	40	43	31	17-1/2	17-1/2	17	12	43	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
	41	44	31-1/2	17-1/2	17-1/2	17	12	44	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
	42	45	32	17-3/4	17-3/4	17	12	45	Long: Body length 1-1/2" longer, sleeves 1" longer than regular.
Jackets, field	34	41	25-3/4	17-1/4	17-1/4	17	12	41	This garment is cut 7 inches over given size.
	35	42	26-1/4	17-1/4	17-1/4	17	12	42	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	36	43	26-1/2	17-1/4	17-1/4	17	12	43	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	37	44	26-3/4	17-1/4	17-1/4	17	12	44	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	38	45	27	17-1/4	17-1/4	17	12	45	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	39	46	27-1/4	17-1/4	17-1/4	17	12	46	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	40	47	27-1/2	17-1/4	17-1/4	17	12	47	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	41	48	27-3/4	17-1/4	17-1/4	17	12	48	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	42	49	28	17-1/4	17-1/4	17	12	49	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	43	50	28-1/4	17-1/4	17-1/4	17	12	50	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
Overcoat, wool (shell collar)	34	39	26	16-3/4	16-3/4	16	12	39	This garment is cut 5 inches over given size.
	35	40	26-1/4	16-3/4	16-3/4	16	12	40	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	36	41	26-1/2	16-3/4	16-3/4	16	12	41	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	37	42	26-3/4	16-3/4	16-3/4	16	12	42	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	38	43	27	16-3/4	16-3/4	16	12	43	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	39	44	27-1/4	16-3/4	16-3/4	16	12	44	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	40	45	27-1/2	16-3/4	16-3/4	16	12	45	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	41	46	27-3/4	16-3/4	16-3/4	16	12	46	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	42	47	28	16-3/4	16-3/4	16	12	47	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	43	48	28-1/4	16-3/4	16-3/4	16	12	48	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
Shirts, cost-style	34	39	26	16-3/4	16-3/4	16	12	39	This garment is cut 5 inches over given size.
	35	40	26-1/4	16-3/4	16-3/4	16	12	40	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	36	41	26-1/2	16-3/4	16-3/4	16	12	41	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	37	42	26-3/4	16-3/4	16-3/4	16	12	42	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	38	43	27	16-3/4	16-3/4	16	12	43	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	39	44	27-1/4	16-3/4	16-3/4	16	12	44	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	40	45	27-1/2	16-3/4	16-3/4	16	12	45	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	41	46	27-3/4	16-3/4	16-3/4	16	12	46	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	42	47	28	16-3/4	16-3/4	16	12	47	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
	43	48	28-1/4	16-3/4	16-3/4	16	12	48	Long: Body length 3 inches longer, sleeves 1 inch longer than regular.
Raincoats, Army	34	41	25-3/4	17-1/4	17-1/4	17	12	41	This garment is cut 7 inches over given size.
	35	42	26-1/4	17-1/4	17-1/4	17	12	42	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	36	43	26-1/2	17-1/4	17-1/4	17	12	43	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	37	44	26-3/4	17-1/4	17-1/4	17	12	44	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	38	45	27	17-1/4	17-1/4	17	12	45	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	39	46	27-1/4	17-1/4	17-1/4	17	12	46	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	40	47	27-1/2	17-1/4	17-1/4	17	12	47	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	41	48	27-3/4	17-1/4	17-1/4	17	12	48	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	42	49	28	17-1/4	17-1/4	17	12	49	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	43	50	28-1/4	17-1/4	17-1/4	17	12	50	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
Working outfit, one-piece	34	41	25-3/4	17-1/4	17-1/4	17	12	41	This garment is cut 7 inches over given size.
	35	42	26-1/4	17-1/4	17-1/4	17	12	42	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	36	43	26-1/2	17-1/4	17-1/4	17	12	43	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	37	44	26-3/4	17-1/4	17-1/4	17	12	44	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	38	45	27	17-1/4	17-1/4	17	12	45	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	39	46	27-1/4	17-1/4	17-1/4	17	12	46	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	40	47	27-1/2	17-1/4	17-1/4	17	12	47	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	41	48	27-3/4	17-1/4	17-1/4	17	12	48	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	42	49	28	17-1/4	17-1/4	17	12	49	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.
	43	50	28-1/4	17-1/4	17-1/4	17	12	50	Long: Jacket length 1-1/2 inches longer and sleeves 1-1/2 inches longer than regular.

FIGURE 11.—Measurements of clothing.

3. Repair of clothing.—*a. Jackets, field.*—(1) Both sides of damaged zippers will be replaced by the method described in paragraph 1*g*.

(2) Worn edges of the sleeve at the wrist will be bound with a strip of similar or matching material. This strip should be approximately

1½ to 2 inches wide and long enough to cover the entire edge of the sleeve. First sew the strip on the inside of the sleeve, with the raw edge turned under, then bring material over the worn edge and sew it on the outside of the sleeve, the raw edge turned under. Care will be taken to have the final stitching cover and conceal the first row of stitches.

(3) Holes in the elbow will be mended with patches of an oval, rather than a square or rectangular shape. Patch both elbows with patches of the same shade and shape, sewn in approximately the same position, with raw edges turned under.

b. Trousers.—Worn bottoms of trousers will be repaired by shortening them approximately 1 inch. Rip the stitches holding the turn-up, press out the crease, cut off all material at the point of wear, turn up approximately 1 inch, and restitch. Sew ripped seams, repair ripped or worn pockets, and replace missing buttons.

c. Breeches.—Replace missing eyelets, sew ripped seams, repair ripped or worn pockets, replace missing buttons and worn or missing laces.

d. Overcoats, mackinaws, coats.—(1) Repairs to sleeves worn at the wrist will be effected by shortening the sleeve. Turn the sleeve inside out, rip the stitches which hold the lining to the sleeve at the wrist, pull out the turn-up, and press out the crease; fold back the turn-up so that the worn part becomes part of the turn-up, usually about ½ inch, and resew the lining by hand. If the cloth has been worn through, darn the hole before refolding.

(2) Repair worn bottoms by ripping the stitches holding the turn-up, press out the old crease, and turn up the bottom until the worn part becomes part of the turn-up, usually about ½ inch. Resew turn-up with machine. Holes should be darned before making new turn-up. Sew ripped seams, repair ripped or worn pockets, and replace missing buttons.

(3) If the bottom of the overcoat is so badly damaged as to be regarded as irreparable, the overcoat will be converted to a mackinaw. Shorten the coat to the same length as a mackinaw of similar size by cutting off the bottom, leaving an additional 1½ inches of material for the turn-up. The material cut from the bottom will be used to make patch pockets, belt loops, and all around belt. Open the side seams, remove the belt, and resew the seams. The pleats in the back will be pressed open. The original overcoat pocket will be removed and the edges of the opening in the coat sewed together. The patch pockets and belt loops will then be attached.

e. Shirts.—(1) Remove worn cuffs and make new cuffs from similar or matching material.

(2) Patch torn elbows as in a field jacket (par. 3a(3)).

(3) If the collar of the shirt is worn through and the other parts are in fair condition, remove the leaf (fold) of the collar by cutting the stitches attaching it to the collar stand. Reverse the collar (leaf) and resew it to the stand, placing the worn part on the under side of the collar. Resew ripped seams and replace missing buttons.

f. Raincoats (other than oil finish).—(1) Repair rips or holes in raincoats by the use of patches or strips of similar or matching material and rubber cement. Apply the patches in a manner similar to that used in tent repair (par 4a(2)). Where practical, patches and strips will be further reinforced by machine stitching.

(2) To repair a rip, cut a strip of material about 2 inches longer than the length of the rip and approximately 1 inch wide. Apply cement, as in the repair of tents (par. 4a(2)), and attach the strip to the inside of the garment at the point of repair. The edges of the tear should be brought together so that they meet in the middle of the strip. If a sewing machine is available, run a row of stitching on both torn edges and another row at the edges of the strip. This stitching will be done while the cement is still damp as the thread will carry the cement into the needle holes and insure the rainproof qualities of the garment.

(3) To cover a hole, a patch will be cut large enough to insure a 1/2-inch lap on all sides of the hole. The method of application is similar to that described above except that the patch will be placed on the face (outside) of the garment. When possible, run a line of stitching around the edge of the patch. These patches should be either circular or oval in shape.

(4) When the sewing method is used, the top thread of the machine must be oiled. This is done by running it through an oil-soaked cloth before it reaches the needle.

g. Underwear.—Mend underwear on the darning machine, resew ripped seams, and replace missing buttons.

h. Socks.—Where skilled labor is available, socks may be darned by hand. In all cases care will be taken to insure a smooth repair, as badly repaired socks result in blistered feet.

i. Woolen gloves.—Darn woolen gloves on darning machine.

j. Blankets.—(1) Darn small holes and rips in blankets on the darning machine.

(2) In case the hole is of considerable size, trim the edges so that the hole will be of a regular shape and the edges even. Then cut a piece of material to match the hole and join the edges by the single-needle machine, using a zigzag cross-stitch.

(3) Repair frayed edges by resewing with the overedge machine.

k. Mosquito bars.—(1) *Rips.*—Bring the edges together and sew through a tape backing.

(2) *Holes.*—Cut an insert fitting the opening, bring the edges together, and sew through a tape backing.

l. Barrack bags. When necessary to patch a barrack bag, sew patch on the outside of the bag, with raw edges turned under, allowing a lap of at least $\frac{1}{2}$ inch on all sides of the opening. Where necessary, sew ripped seams and replace rope.

4. Repair of canvas and webbing.—*a. Heavy canvas.*—(1) Heavy canvas will be repaired by sewing, either by machine or hand, or with cement patches, whichever is more practical.

(2) Where repairs to small damaged areas are to be made, the cement patch is preferable, and a suitable patch conforming to the sizes listed in the table below will be used.

Patch No.	Diameter of patch (inches)	Maximum size of hole or rip (diameter or length, inches)
1-----	3-----	$1\frac{1}{2}$
2-----	$4\frac{3}{8}$ -----	$2\frac{7}{8}$
3-----	$6\frac{1}{4}$ -----	$4\frac{3}{4}$

Before applying the patch remove foreign materials, such as dirt and grease, from the damaged area of the canvas. Then apply a thin coating of cement to that area and to the entire surface of one side of the patch. After the first coating of cement has dried to a "tacky" state, apply a second coating of cement. While the surface of the canvas and the patch are still wet, press them together and hold in place with a flat weight until the cement has thoroughly dried. For the cement method of canvas repair, all patches should be circular in shape and applied to the outside surface of the tent; the raw edge of the patch should *not* be turned under.

(3) Holes or rips in canvas which are too large for repair by cemented patches will be repaired with patches or panels of matching materials sewn to the canvas, by machine or by hand. Shape the patch, except as noted below, so as to cover the damaged area of the canvas, making it large enough to permit a complete overlap of $\frac{3}{4}$ inch on all sides, with the raw edge turned under. Never use a circular patch for a sewed repair job, as it is too difficult to turn under the raw edge; use square, rectangular, or other angular shapes. (No. 10/3 cord thread will be used for stitching tent patches.)

b. Light weight canvas.—Shelter halves, etc., will be repaired when necessary exclusively by the sewing method, as the use of cemented patches is not recommended for such articles.

c. Other repairs to canvas.—The following general rules will apply to the repair of all canvas:

- (1) Ripped seams, or seams which have become loose, will be resewn.
- (2) Missing or badly worn ropes and lines will be replaced.
- (3) Missing grommets will be replaced. All grommets will be tightened and, wherever necessary, reinforced or resewn.

d. Webbing.—(1) Webbing will be repaired wherever possible. These repairs will consist largely of sewing ripped seams and replacing hardware (buckles, fasteners, belt hooks, end clips, etc.), and other missing parts.

(2) Canvas leggings will be marked for repair, and any open or ripped seams will be resewn. Any missing or worn parts, such as rivets, buckles, eyelets, hooks, straps, and laces will be replaced. The leggings will then be sized and paired with regard to size, color, and general appearance.

e. Patching materials.—Wherever possible materials used for patching and replacement will be secured from similar articles declared irreparable.

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BY ORDER OF THE SECRETARY OF WAR:

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(For explanation of symbols see FM 21-6.)

